

PERCEPTIVE ASSESSMENTS OF SELECTED
DISSEMINATION STRATEGIES FOR
INTERNATIONAL AGRICULTURAL
RESEARCH CENTER FINDINGS

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CHAPTER I

INTRODUCTION

Although the colleges and universities in the Western Hemisphere over the years have continually enrolled and trained students from underdeveloped and developing countries, the growth and efficiency in agricultural production is still unable to meet demands for agricultural products in developing countries.

The possibility of improving both efficiency and growth of agricultural products has been greatly enhanced by the establishment of 13 International Agricultural Research Centers in the past two decades. However, some countries which could greatly benefit from the use of these International Agricultural Research Centers have been quite limited in their ability to do so. The problem as to how these developing countries could best obtain and utilize research findings from these more recently established centers does seem to remain largely unanswered.

Statement of the Problem

Despite the fact that 13 International Agricultural Research Centers in various parts of the world have now been established for the purpose of improving the quantity and

the quality of production of agricultural products, a concomitant goal of the elimination of widespread malnutrition remains largely unattained. Faced with a number of accompanying problems, not the least of which is the demands of an ever growing production, some needy countries seem to have been unable to make maximum needed utilization of services rendered by these Centers (CGIAR, 1980, p. 1-8).

Some of the factors that keep developing countries from benefitting from the work of Research Centers are alleged to be: (1) lack of support by political and administrative leaders, (2) the higher educational institutions of agriculture not functioning effectively, (3) lack of continuity of planned programs, (4) lack of knowledge and appreciation for the value of agricultural research as held by political and administrative leaders, (5) meager productive relationships among the Experimental Centers, Institutions of Higher Education, and Ministries of Agriculture and/or Agricultural Extension Programs, and (6) lack of long-term, continuous support for research (Gowdar, 1983, p. 3 and Price, 1984, p. 59-69).

Also, to be noted is the absence of graduate training, the lack of effective Extension Services, the inadequate salary for qualified scientists and paucity of up to date equipment and supplies. These are some of the reasons often cited as to why developing countries have been unable to utilize findings and information available from the

International Research Centers (Gowdar, 1983, p. 3; Haws, 1982, p. 543-553; Madamba, 1981, p. 1-52; and Read, 1980, p. 38).

Purpose of the Study

A major purpose of this study was to obtain and analyze perceptions of (1) functioning personnel at the 13 International Agricultural Research Centers (IARC's) and (2) International students studying Agriculture at Oklahoma State University (OSU), as to how the Research Centers can best disseminate and utilize information obtainable from the International Agricultural Research Centers. Further, a concomitant purpose of this study was to identify additional elements of strategy which might enhance more effective dissemination and utilization of research findings from International Agricultural Research Centers to farmers and producers in developing countries.

Objectives of the Study

The following objectives were formulated in order to accomplish the purpose of this study.

1. To review and briefly narrate the experimental work now being conducted at each of the Centers which might relate to the nature and extent dissemination accomplishment and needs.

2. To secure the perceptions of functioning personnel serving at each of the 13 International Agricultural

Research Centers as to (1) the extent of present usage of each of 15 selected strategies for dissemination information obtainable from the Research Centers and (2) the relative effectiveness of strategies now being used to disseminate Center findings, and (3) the anticipated effectiveness if each strategy was fully implemented.

3. To secure the perceptions of International students studying Agriculture at Oklahoma State University on (1) the extent of present usage of each of 15 selected strategies for dissemination of information obtainable from the Research Centers, and (2) the relative effectiveness of strategies now being used to disseminate Center findings, and (3) the anticipated effectiveness if each strategy was fully implemented.

Assumptions and Limitations of the Study

Assumptions

The following assumptions were made for the purpose of this study:

1. It was assumed that functional personnel at the 13 International Agricultural Research Centers and International students studying Agriculture at Oklahoma State University would willingly and sincerely respond to the items on the data gathering instruments.

2. It was further assumed that information obtained in this study will benefit functional personnel at the

International Agricultural Research Centers, International students studying Agriculture at Oklahoma State University, and other interested persons to improve the relay of, and utilization of, the information obtainable from the Centers, not only to the country in which the Center is located but to other developing countries as well.

Scope and Limitations

Limitations of the study were recognized as follows:

1. Only functioning personnel at the 13 International Agriculture Research Centers were contacted. No attempt was made to secure information from additional scientists located at other Experiment Stations in developing countries.

2. In terms of the selection of students this study was limited to the International students studying Agriculture at Oklahoma State University.

3. The information to be secured was confined to (1) information about the nature and extent of research conducted at each Center and (2) perceptions as to the present and future effectiveness of selected dissemination strategies for getting research findings into the hands of agricultural product producers.

Definition of Terms

Various terms and colloquial expressions used in this study are defined as follows:

Agricultural Extension: The link between agricultural research and education on the one hand and the practicing farmer and livestock owner on the other.

Audiographics: Refers to the transmission of graphics and text information over a narrow band telecommunications channel, such as a telephone line or radio subcarrier (Olgren and Parker, 1983, p. 321).

CGIAR (Consultative Group on International Agricultural Research): It was organized in May of 1971 to bring together countries, public and private institutions, international and regional organizations, and representatives from developing countries in support of a network of International Agricultural Research Centers and programs so as to increase the quantity and improve the quality of the food supply in developing countries (Price: Readings, 1984, p. 466).

CIAT: International Centre for Tropical Agriculture, Cali, Colombia, is concerned with the production of the food staples of the tropics of the Western Hemisphere, particularly beans, cassava, rice, and beef. It was established in 1968 (Price: Readings, 1984, p. 465).

CIMMYT: International Maize and Wheat Improvement Centre, El Batan, Mexico, supports research around the world on maize and wheat as well as other major cereals such as barley and triticale. It was established in 1968 (Price: Readings, 1984, p. 465).

CIP: International Potato Center, Lima, Peru, aims to improve the Solanum potato and to develop varieties suitable for growing in many parts of the developing world, where it has great potential. It was established in 1972 (Price: Readings, 1984, p. 465).

Communication: A process of exchange of ideas between a sender and a receiver. Communication can be intrapersonal (a person thinking for himself) or interpersonal (a person sharing information with others).

Dissemination: Refers to the spreading of knowledge and techniques of agricultural food production to farmers and/or producers, particularly for this study, the spreading of information from the IARC's. Dissemination is achieved through publications, conferences and seminars, the maintenance of information systems, and, more importantly, by training scientists from developed and developing countries, by providing technical assistance to national and regional research programs, and by Colleges, Agricultural Extension Services, and Experiment Stations.

Experiment Stations: Are one of the most important components of agricultural research systems, functioning as the link between Educational Institutions and Agricultural Extension Services. It more often includes experimental fields and other facilities as well as a complex structure of roads, drainage canals, electric distribution systems, potable water, sanitary facilities, maintenance workshops, storerooms, equipment, vehicles, administrative offices,

medical services, and recreational facilities.

Extension staff: Personnel employed by the state government or private sectors trained for the purpose of disseminating agricultural research findings and making recommendations to the farmers.

FAO: The Food and Agriculture Organization of the United Nations is an autonomous agency in the United Nations family of agencies. It is an institutional grouping of 147 nations that have pledged themselves to action for the purposes of raising levels of nutrition and standards of living of the peoples under their respective jurisdictions; securing improvements in production and distribution of all food and agricultural products; bettering the condition of rural populations; and thus contributing to an expanding world economy and ensuring humanity's freedom from hunger (IADS, 1980, p. 34).

Farming Systems: The total production and consumption decisions of the farm household, including the choice of crop, livestock and off-farm enterprises and food consumed.

Food Corps: Is a program adopted by certain developing nations that brings technicians, Extension personnel and farmers together in a mutual concern to increase food production. Chosen farmers are sent to institutes for training and return to villages to provide teaching and service (Price, Readings, 1984, p. 331-334).

Functioning Personnel: This term is inclusive of all individuals engaged in planning, conducting research,

analyzing data, and disseminating information derived from the operation of each Research Center.

Germ Plasm: Is the reproductive tissue of plants and animals and is broadly based genetic resources and materials sufficiently diverse to maintain all of the variability of a species. In 1974, an international organization was formed which has the expertise and the funds with which to arrange systematic collections of important germ plasm; to evaluate, describe, and maintain it; and to make it available to scientists anywhere (Wortman and Cummings, 1978).

IARC'S: International Agricultural Research Centers first opened for business in the Philippines in 1960. The Centers have multiplied into a worldwide network of the 13 Institutions. They develop improved crop varieties, livestock, and farming systems to increase food production in the developing countries and improve the lot of poor farmers (CGIAR, 1980, p. 2-4).

IBPGAR: International Board for Plant Genetic Resources, Rome, Italy, supports and promotes a network of international and national genetic resource centres to collect and preserve plant germ plasm. It was established in 1973 (Price: Readings, 1984, p. 466).

ICARDA: International Center for Agricultural Research in the Dry Areas, Beirut, Lebanon, and Aleppo, Syria, concentrates on rainfed agriculture and semiarid regions of North Africa and West Asia, with emphasis on durum wheat, barley, faba beans, and lentils. It was established in 1976

(Price: Readings, 1984, p. 466).

ICRISAT: International Crops Research Institute for the Semiarid Tropics, Hyderabad, India, is concerned with improving the quantity and reliability of food production in semiarid regions of Africa, Asia, Latin America, and the Middle East, with emphasis on sorghum, pearl millet, groundnuts, chickpeas, and pigeon peas. It was established in 1972 (Price: Readings, 1984, p. 465).

IFPRI: International Food Policy Research Institute, Washington, D.C., USA, focuses on the sensitive economic and political issues surrounding food production, food distribution, and the international food trade. It was established in 1975 (Price: Readings, 1984, p. 466).

IITA: International Institute of Tropical Agriculture, Ibadan, Nigeria, concentrates on lowland tropical agriculture worldwide, with emphasis on roots and tubers, cereals, and grain legumes, as well as the improvement of traditional farming systems. It was established in 1965 (Price: Readings, 1984, p. 466).

ILCA: International Livestock Centre for Africa, Addis Ababa, Ethiopia, carries out research and development on improved livestock production and marketing systems for tropical Africa. It was established in 1974 (Price: Readings, 1984, p. 466).

ILRAD: International Laboratory for Research on Animal Diseases, Nairobi, Kenya, seeks controls for two major livestock diseases, trypanosomiasis and theileriosis, that

limit livestock production in huge areas of Africa, Asia, Latin America, and the Middle East. It was established in 1974 (Price: Readings, 1984, p. 466).

IRRI: International Rice Research Institute, Los Banos, Philippines, the first of the International Centres continues to work on the improvement of tropical rice and rice-based cropping systems and related technologies. It was established in 1960 (Price: Readings, 1984, p. 465).

ISNAR: International Service for National Agricultural Research, The Hague, Netherlands, the youngest of the Centres, responds to requests from developing countries for assistance in strengthening their national agricultural research programs. It was established in 1979 (Price: Readings, 1984, p. 406).

Research Information: The communication or reception of knowledge and intelligence. As used on this study, it refers to communication of scientifically based agricultural research from IARC's to the farmers, producers and interested person(s).

Sarvodaya: Means "the awakening of all" (a term coined by Ghandi in India). It is a title for a Village Development Scheme in Sri Lanka organization "camps" in which the participants from within and outside villages (quite often from foreign countries, too) give their labor to provide a basic utility in the village (Price, Readings, 1984, p. 199-200).

Telecommunications: The use of wire, radio, optical or

other electromagnetic channels to transmit or receive signals for voice, video, and data communications; communications over distance using electronic means (Olgren and Parker, 1983, p. 330).

Teleconferencing: Two-way electronic communication between two or more groups, or three or more individuals, who are in separate locations; includes group communication via audio, audiographics, video and computer systems (Olgren and Parker, 1983, p. 330).

Total Mean: Is the sum of the total scores divided by the total number of subjects.

UNDP: The United Nations Development Programme is the financial hub for technical assistance activities in the UN system. It was established in 1966 as a result of the merger of the Expanded Program of Technical Assistance, established in 1949, and the Special Fund, established in 1959. The financial resources of UNDP come principally from voluntary contributions pledged by member governments. As of June 1979 UNDP commitments to agricultural development projects (e.g., rural institutions, services and training, crop production, animal production and health, fisheries, forestry, and land and water use) in 150 countries and territories amounted to over US \$850 million (IADS, 1980, p. 85).

The World Bank: The World Bank, established in 1945, is a group of three institutions: the International Bank for Reconstruction and Development, the International

Development Association (established in 1960), and the International Finance Corporation. With certain exceptions reserved by the Articles of Agreement, the Governors have delegated their powers to a Board of Executive Directors, which performs its duties on a fulltime basis at the bank's headquarters. Of the 20 Executive Directors, five are appointed by the five members with the largest number of shares, and the rest are elected by the other members (IADS, 1980, p. 89).

WARDA: West Africa Rice Development Association, Monrovia, Liberia, aims to promote self-sufficiency in rice for a 15-country region where rice is a staple food and where there is great potential for increased production. It was established in 1971 (Price: Readings, 1984, p. 466).

CHAPTER II

REVIEW OF LITERATURE

Purposes and Objectives of International Agricultural Research Centers (IARC's)

The International Agricultural Research focuses on the problems of developing countries. The research done by these Institutes is intended to help raise food production in the developing countries. In recent years, research at these Centers has been expanded to include cultivation systems and techniques, as well as economic and social aspects having a crucial bearing on food production (Bengtsson, 1983).

The Research Institutes play an important part in producing new knowledge both of a general and of a more specific kind (Bengtsson, 1983). They bring the resources of modern biological and socioeconomic research to bear on the problems of improving agricultural productivity in the tropics and subtropics where most of the developing nations lie. Widely recognized for scientific excellence and worthy purpose, the Centers attract talented, dedicated scientists from all over the world interested in finding practical solutions to the world's food problems. The Centers form multi-disciplinary teams of diverse specialists for the

improvement of major crops and farming systems, supported by research resources not available in most national programs.

The International Agricultural Research Centers also serve as unique training institutions to carry out their own research, as well as to collaborate with national programs in developing, testing, and adopting new technologies. Several hundred trainees who come to the Centers each year spend 3 to 12 months working under the guidance of senior staff scientists and training specialists in the fields and laboratories--a novel experience for many agricultural graduates from developing nations, where academic training often does not include practical experience in actual farming or production research. The purpose of the in-service training is to produce the well-prepared, dedicated researchers and other specialists sorely needed in the developing nations. The Research Centers also afford research opportunities to M.S. and Ph.D. candidates, Postdoctoral Fellows, and Visiting Scientists whose projects are relevant to the Centers' primary mission (CGIAR, 1980).

Each Research Center has a General Director--normally a prominent scientist in that Center's area of specialization--and an International Scientific Staff. Each also has its own independent Board of Trustees, which sets general policies and priorities. The Centers are independent entities, shaped by the types of research they conduct, their locations, and, of course, the people who set their policies and administer them. They vary considerably

in size, scope, and style, but there are essentially four types of IARC: (a) Centers with regional rather than global operations, like the West African Rice Development Association (WARDA), or the International Livestock Center for Africa (ILCA); (b) Centers like the International Center for Tropical Agriculture (CIAT) in Colombia's humid lowlands, and the International Crops Research Institute for the Semiarid Tropics (ICRISAT) in India, that were established to conduct research on food crops in those agroclimatic zones that have been largely neglected by agricultural science in the past; (c) the crop-specific centers, like the International Center for Improvement of Maize and Wheat (CIMMYT), the International Rice Research Institute (IRRI), and the International Potato Center (CIP) in Peru, that aim the main thrust of their research efforts at improving major staple food crops; and (d) Centers that are not active in agricultural research but are concerned with vital related issues such as economic and trade policy, preservation of plant genetic resources, and development of agricultural research capacity at the national level in the developing countries (IDRC, 1983).

Many formal and informal links exist between the Centers. There are frequent exchanges of scientists so that work can proceed on projects more suited to one area than another. For instance, ICRISAT, which has the main responsibility for sorghum improvement, has a scientist based at CIMMYT working on the development of highland

sorghum varieties for Central and South America. The Centers often collaborate to present seminars, workshops, or training programs on a particular topic. And both the Center Directors and the Board Chairpersons hold informal meetings at regular intervals (IDRC, 1983).

According to Kriesberg (1981), the Ford and Rockefeller Foundations established four International Agricultural Research Institutes: IRRI, 1960; CIMMYT, 1966; IITA (International Institute for Tropical Agriculture), 1967; and CIAT, 1968). The Foundations decided that while the Institutes were a most worthwhile venture, the financial requirements were more than they could provide for long. However, other donors were becoming interested in providing assistance as the potential of the Centers became clearer. The Foundations sponsored several joint meetings with prospective donors in Bellagio, Italy, which led to the creation of the CGIAR (Consultative Group on International Agricultural Research), sponsored by three International Organizations: the World Bank, the United Nations Developmental Program (UNDP), and the Food and Agricultural Organization of the United Nations (FAO).

In 1971, the Consultative Group on International Agricultural Research (CGIAR) was organized to secure the financing of agricultural research at a number of International Institutes. The CGIAR is composed of representatives from donor agencies concerned with the broad field of International Agricultural Research that consults

on meeting the financial needs of selected activities that the CGIAR has jointly agreed to launch and/or financially support.

Initially, there were 16 charter donor members beyond the two foundations and three sponsors: Belgium, Canada, Denmark, the International Development Research Center (Canada), the W. K. Kellogg Foundation, the Kresge Foundation (1972 only), Netherlands, Norway, Sweden, United Kingdom, and the United States. Membership was entirely voluntary. Provision was also made for fixed-term representation from the developing countries.

The Group is co-sponsored by the FAO, the World Bank, and UNDP, and now has some 46 members. These include 38 donor nations, international organizations, foundations and two members selected by the FAO from developing countries in each of the five major developing regions of the world. FAO members elect a representative and an alternate to participate in the Group's deliberations. Recently, some developing countries have joined the Group donors (CGIAR, 1984; Bengtsson, 1982; and Kriesberg, 1981).

The World Bank provides the Group with its chairman and secretariat. To assist the Group, a Technical Advisory Committee (TAC) has been set up and has the task to define priorities for research and to advise on emergent needs and opportunities for research. The FAO provides the secretariat for TAC. The TAC is composed of 13 distinguished agricultural and social scientists who are

nominated by the co-sponsors and approved by the CGIAR members. These scientists are drawn from both developed and developing countries. All the Institutes are independent bodies, governed by autonomous self-perpetuating Boards of Trustees. Now, CGIAR, as a Group, has the possibility to approve three members of each Board. Some Boards have an equal number of representatives of developed and developing nations (Kriesberg, 1981; Bengtsson, 1982).

Location and Area of Research for the Thirteen IARC's

The 13 Institutions that make up the Center group network today as shown in Figure 1 and Table I are:

CIAT: Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture), Cali, Colombia, is concerned with production of the food staples of the tropics in the Western Hemisphere, particularly field beans, rice, cassava, and tropical pastures. It was established in 1968 and has special emphasis on crops indigenous to Latin America and those found worldwide in lowland tropics. The major goal for research done at this Center is to increase the quality and quantity of specific basic food commodities in the tropics, primarily in Latin America and the Caribbean (CGIAR, 1983; IDRC, 1983).

CIMMYT: Centro Internacional de Mejoramiento de Maiz y Trigo (International Maize and Wheat Improvement Center) at El Baton, Mexico, was initiated in 1968. It supports

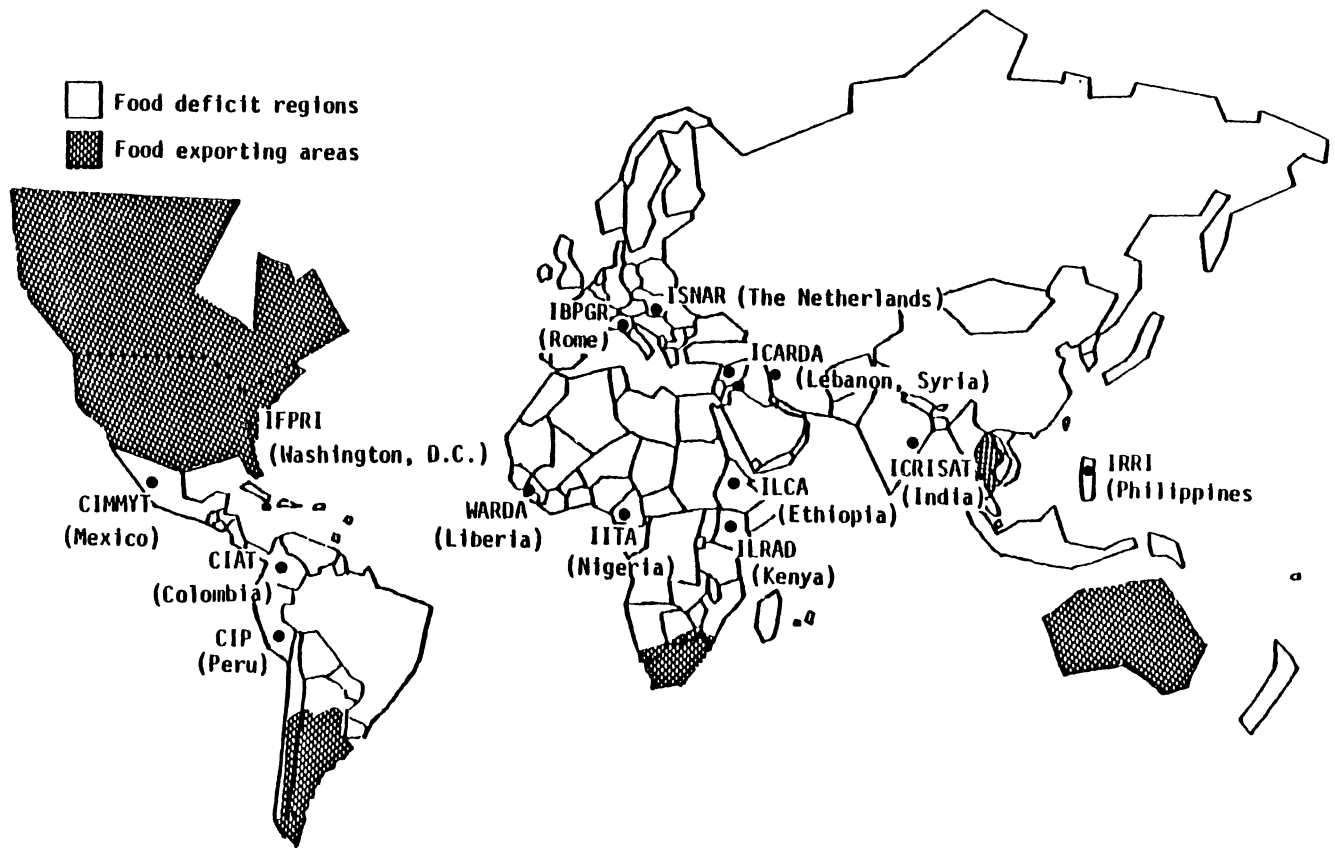


Figure 1. The International Agricultural Research Network (WOLFF, 1981, P. 6)

TABLE I
LOCATION AND AREAS OF RESEARCH OF INTERNATIONAL RESEARCH
INSTITUTES (BENGTSSON, 1982, pp. 38-39)

Centre	Location	Research	Coverage	Date of initiation
IRRI (International Rice Research Institute)	Los Banos, Philippines	Rice under irrigation, multiple cropping systems and upland rice	Worldwide, special emphasis on Asia	1960
CIMMYT (International Centre for the Improvement of Maize and Wheat)	El Batan, Mexico	Wheat, triticale, barley and maize	Worldwide	1964
CIAT (International Centre for Tropical Agriculture)	Cali, Colombia	Cassava, field beans, rice and tropical pasture	Worldwide in low land tropics, special emphasis on Latin America	1968
IITA (International Institute of Tropical Agriculture)	Ibadan, Nigeria	Farming systems, cereals, cowpeab, soybeans, lima beans, pigeon peas, cassava, sweet potatoes and yams	Worldwide in lowland tropics, special emphasis on Africa	1965
CIP (International Potato Centre)	Lima, Peru	Potatoes (for both the tropics and temperate regions)	Worldwide, including linkages with developed countries	1972
ICRISAT (International Crops Research Institute for the Semi-Arid Tropics)	Hyderabad, India	Sorghum, pearl millet, pigeons peas, chick-peas, farming systems and groundnuts	Worldwide, special emphasis on dry semi-arid tropics, non-irrigated farming	1972
ILRAD (International Laboratory for Research on Animal Diseases)	Nairobi, Kenya	Trypanosomiasis, theileriosis (mainly east coast fever)	Africa	1974
ILCA (International Livestock Centre for Africa)	Addis Ababa, Ethiopia	Livestock production systems	Major ecological regions in tropical zones of Africa	1974
IBPGR (International Board for Plant Genetic Resources)	FAO, Rome, Italy	Conservation of plant genetic resources	Worldwide	1973
WARDA (West African Rice Development Association)	Monrovia, Liberia	Regional cooperative effort in adaptive rice research among West African countries	West Africa	1971
ICARDA (International Centre for Agricultural Research in Dry Areas)	Aleppo, Syria	Barley, lentils, broad beans and farming systems including animal husbandry	Emphasis on dryland farming and arid areas in Near East and North Africa	1976
IFPRI (International Food Policy Research Institute)	Washington, USA	International food policy and food distribution	Worldwide	1975
ISNAR (International Service for National Agriculture Research)	The Hague, The Netherlands	International service organisation	Worldwide	1979

research around the world on maize and wheat as well as other major cereals such as barley and triticale. Its major research is to promote and conduct, national and international programs to improve maize and wheat production. The further research done in the Institute is to develop superior wheat, barley and triticale germplasm for higher and more stable yields and better nutritional quality (CGIAR, 1983; IDRC, 1983).

CIP: Centro Internacional de la Papa (International Potato Center), located in Lima, Peru, was established in 1972. Its goals are to develop, adopt and expand the research necessary to solve priority problems limiting potato production in many parts of the developing countries. Specific research goals carried out at this Center are to increase the yield, stability, and efficiency of production of the potato in developing countries where it is grown, and to improve the potato's adaptability to both heat and cold. Coverage is worldwide, including linkages with developed countries (CGIAR, 1983; IDRC, 1983).

ICARDA: International Center for Agricultural Research in the Dry Areas, located in Beirut, Lebanon, and Aleppo, Syria. The major research goal at this Center is to improve the agricultural systems and major food crops of the drier regions of Western Asia and North Africa. Two major ecological zones are to be served: the low elevation, Mediterranean-type climate of cool, moist winters and hot, dry summers, and the high elevation plateaus with extremes

of winter cold and summer heat, and snow cover for up to five months a year. The Center was initiated in 1976 and conducts research on barley, durum wheat, lentils, broad beans or faba beans, and farming systems including animal husbandry (CGIAR, 1983; IDRC, 1983).

ICRISAT: International Crops Research Institute for the Semiarid Tropics, located in Hyderabad, India, was established in 1972. The main research effort at this Center is directed toward developing improved farming practices and establishing better varieties of major food crops in order to improve the welfare of the poorest population of the semiarid tropics, estimated to number about 700 million. Major research programs are on sorghum, pearl millet, pigeon peas, chick-peas, farming systems and groundnuts (CGIAR, 1983; IDRC, 1983).

IFPRI: International Food Policy Research Institute, located in Washington, D.C., USA, was initiated in 1975. The mission of this Center is to provide an objective analysis on sensitive economic and political issues surrounding world food problems. It is also to determine those actions and policies that could be adopted by governments and regional and international agencies to effect a continued increase in the quantity and quality of food supplies and trade available to all people through enhanced food production, wider opportunities, and improved efficiency and equity food distribution (CGIAR, 1983; IDRC, 1983).

IITA: International Institute for Tropical Agriculture, located in Ibadan, Nigeria, was established in 1965. The major research goal of this Center is to improve the quality and quantity of food production in the humid and subhumid tropics through the improvement of important crops and the evolution of appropriate farming systems as alternatives of traditional low-yielding systems of cultivation. Major emphases are on roots and tubers (sweet potatoes, yams), maize, rice, and food legumes (cowpea, lima bean, soybean), as well as the improvement of traditional farming systems (CGIAR, 1983; IDRC, 1983).

ILCA: International Livestock Center for Africa, located in Addis Ababa, Ethiopia, was established in 1974. The main goal of this Center is to assist national efforts focusing on changing production and marketing systems for tropical Africa to increase the output of livestock products, and improve the quality of life of the people of this region. The Center promotes the development of improved production systems, and, as a training center, it seeks to increase regional competence, as it functions as a multidisciplinary documentation center for the African Livestock Industry (CGIAR, 1983).

ILRAD: International Laboratory for Research on Animal Diseases, located in Nairobi, Kenya, was established in 1974. The major research goal of this Center is to develop effective and economically viable measures to control two major livestock diseases, trypanosomiasis and theileriosis,

which seriously limit livestock production in Africa, Asia, Latin America, and Middle East (IDRC, 1983).

IRRI: International Rice Research Institute, located at Los Banos, Philippines, the first of the International Centers was first initiated in 1960. It continues to work toward the improvement of tropical rice and rice-based cropping systems and related technologies. The major objective of this Center is (1) to conduct research leading to increased rice production, and (2) to provide assistance to national rice research institutions to increase their capacity to improve and adopt rice technology to local conditions (CGIAR, 1983; IDRC, 1983).

ISNAR: International Service for National Agricultural Research, is located in The Hague, Netherlands. It was initiated in 1979 and is the youngest of the Centers. The major objective of this Center is to assist developing nations to plan, organize, and maximize research more effectively. This includes assistance in identifying research problems formulating research policies, and assistance in the development of adequate institutional infrastructures, as well as promote specific national or regional agricultural research programs. The Center responds to requests from developing nations for assistance in strengthening their national agricultural research programs (CGIAR, 1983; IDRC, 1983).

WARDA: West Africa Rice Development Association, located in Monrovia, Liberia, was first initiated in 1971.

The major goal of the Center is to help in achieving self-sufficiency in rice production within the region as soon as possible. This is to be done by selection and promotion of improved varieties and practices through programs of development, research, training, and dissemination of information. The CGIAR is directly concerned with only certain aspects of the research programs. The Center assists 15 West African countries where rice is a staple food and where there is a great potential for increased production (CGIAR, 1983; IDRC, 1983).

Function of IARC's

A major function of IARC Centers is to provide scientifically proven information which can be applied to a nation's agriculture in order to increase production. For crops, this may be increasing yields per acre and for animals increase in milk, eggs or meat per animal unit.

The Centers operate under arrangements with their host country and enjoy international status. Generally, the host country provides the land for the Center and has at least one member, with ex-officio status, on the Board of Directors. The Center or program itself has its own formal structure for management, each having an International Board of Directors. The Board sets policy, hires the Director of the Center or program.

The primary research focus is on food crops and livestock raised by poor farmers, and eaten by poor

consumers in developing nations. The general nature of the activities within these categories may be outlined as follows: (1) crop improvement, (2) livestock improvement, (3) farming systems, and (4) other research. All work is carried out in close cooperation with developing nations (Kriesberg, 1981).

Crop Improvement

The early goal of IRRI and CIMMYT was to obtain higher yields. The greatest emphasis was given to improving plant characteristics and product quality. In recent years, particular attention has been given by all the Centers to factors which improve yield stability and ability to withstand adverse conditions, both climate and soil. The latter course has been taken to extend the benefits of the new technology to disadvantaged or previously by-passed farmers, often those operating on poor soils and without irrigation (CGIAR, 1980). According to Kriesberg (1981), crop improvement activities are of four main types:

- (1) Genetic resources and testing. To develop improved plants through plant breeding, genetic stocks must be built up, crossed, and tested on a vast scale;
- (2) Development of pest and disease resistance. An attempt is made to build in as much resistance as possible to minimize the need for chemical control methods. This is of vital importance for smaller farmers who have neither the funds nor the knowledge to adopt such techniques;
- (3) Tolerance to adverse climatic and soil conditions. Researchers attempting to develop increased plant tolerance of drought, high or low temperatures, adverse soil conditions, and other factors. Increased tolerance will make it possible to use the technology in disadvantaged areas;
- (4) Nutritional quality. In making the

above improvements, scientists assure that the nutritive value of the crop is not lowered, and where possible is raised. Special attention has been given to improving the protein quality of corn (p. 14).

Other important areas of research work which do not fit the above categories include: wide crosses, such as between wheat and rye, to produce triticale, a new crop; and the development of true seed tuber crops, which could lead to a significant reduction in costs of production for small farmers.

Livestock Improvement

This work is concentrated in two Centers in Africa. One is devoted to seeking a cure for two of the major livestock diseases (trypanosomiasis and theileriosis) of our time, and the other is devoted to finding ways of developing improved livestock farming systems in Africa. Improved pastures for livestock are being studied at CIAT, located in Colombia, South America.

Farming Systems

In developing nations, monoculture is seldom practiced with domestic food crops. They are generally raised together with other crops and sometimes involve livestock. Thus, improvements in a single crop or animal may not contribute a great deal to the welfare of the farmer unless they fit in with his farming pattern.

Other Research

Economists and social scientists are involved in all the foregoing areas of work. In some cases, the crop or farming systems work also includes the development of associated but small scale equipment. The purpose of these machines is to make it possible to intensify production and raise yields without displacing labor (Kriesberg, 1981).

In the 1970's, the Consultative Group on International Agricultural Research realized that more attention should be given to strengthening national agricultural research programs. After an extended search for an institutional mechanism, the Consultative Group in 1979 established ISNAR. Individual donor members of the Group, as well as others, have increased bilateral support to national programs. Stronger national research programs will help in generating new technology and in adapting the technology developed by the International Centers for local conditions. Thus, national and international research activities will reinforce each other (Kriesberg, 1981).

In 1980, according to statistics, per capita food production in the developing countries averaged 5 percent higher than it had been before 1960.

Less than 10 years after the establishment of IRRI, the high-yielding rice varieties spread rapidly over Asia, increasing the harvest by over \$300 million of value. Ten years later, IRRI's rice was planted on some 25 million hectares, about one-quarter of the rice-growing area of

Asia. Meanwhile, the improved Mexican wheats were taken over some 29 million hectares worldwide. The bonus yielded by the two improved crops were feeding some 300 million people (Wolff, 1981).

The Nature and Principle of the
Dissemination of Ideas
and Practices

Since agricultural development is a basic need of almost all the developing countries, the latest agricultural technology must be put into practice in the farmer's field. In a study done by Kharus and Singh (1980), radio was shown to play an important role in transferring of the latest agricultural information to a large number of farmers in Haryana, India, in a limited time. Although, most developing countries in Asia have well-established agricultural research and educational institutions. Their agriculture has been substantially strengthened through the development of International Agricultural Research Centers (IARC's). This scientific knowledge must be adopted and packaged before it can be utilized by farmers, its intended beneficiaries. Information service units of agricultural research and educational organizations facilitate communication by adapting information to an easier usable form to speed the knowledge-production-and-utilization process. Information units support agricultural improvement programs by providing devices such as technical writing and

editing, graphic arts, photography, audiovisual production, typesetting, printing, library units, information retrieval, and mailing (Gowdar et al., 1983).

Since there is a wide discrepancy in education between those involved in agricultural research and those in agricultural practice, presentation of agricultural research findings would be completely different for the two groups. In some countries, at least, the farming community is likely to be largely illiterate, which means that information can only be transmitted orally or pictorially (Sattar and Lancaster, 1984).

According to Madamba (1981), because of a lack of information services, Asian researchers often are isolated from scientific events in developed nations, and Agricultural Extension programs almost invariably suffer from the absence of mass media support. Read (1980) also observed an alarming shortage of educated, trained, and experienced rural communication specialists in Asia. He noted that national colleges and universities in Asia offer courses in agricultural journalism and stressed the need to establish a national or regional center for training in agricultural communication. Byrnes (1980) suggested that IARC's could assist national programs by providing short courses and internships for information workers and that relevant audiences of IARC communication efforts should be defined and priorities and budget allocations for communication training be established.

Using video tapes is an easy and practical way of demonstrating desired information. The cost of video equipment and tape is not as much as one might think. Video has the capacity of producing a copy of an expensive or time consuming demonstration so that the demonstration will not have to be repeated. The cost of video recording equipment has decreased in the past few years, making it more feasible for classroom use. Recorded tapes stored for future use can be erased and recorded if the information becomes obsolete (Patterson, 1981). Instead of taking a field trip to a farm or bringing an animal to the school, the portable video tape can be taken to the farm, the skill demonstrated and recorded and then brought to the classroom for presentation on the TV monitor (Ombal, 1970).

The use of transparencies with an overhead projector may be considered as an extension of the chalkboard. Charts, drawings, definitions, and even a course outline which teachers use during the year can be preserved on acetate transparencies and used again and again (Claxton, 1971).

Teleconferencing, an area of telecommunications, is rapidly expanding. Teleconferencing helps people become more efficient, more productive, and more effective. In order to inter-connect people, teleconferencing systems often use telecommunications channels that range from regular telephone lines to satellite links (Olgren and Parker, 1971).

The training and visit system developed by Benor (1982) is a method which ensures that extension agents receive adequate training so that they are qualified to meet and advise farmers in a regular, continuous manner, and bring farmers' problems back to research for solutions. In the Philippines, the most effective way of creating development awareness is personal communication--meetings, house-to-house, and person-to-person approaches.

Summary of Studies Particularly Related
to Dissemination Practices Applicable
to Agriculture and Agricultural
Production

Agricultural research begins and ends on the farm. As the Research Centers develop cultivars and farming systems appropriate to countries, it is important to know how to communicate the results of their work and transfer their technologies to those who can best help the ultimate client, the farmers (Haws, 1982).

Making improved germplasm available to national programs and collaborating with scientists is the most effective way to communicate the results of the research. Breeding lines of mandate crops that have progressed through a crossing stage to the formation of varieties, acceptable for national release, and in the hands of farmers give them higher yields, are solid evidence that Research Centers are meeting their goals in crop improvement. Meetings, training

programs, Center tours by Visiting Scientists, and publications are also important ways of telling the research story (ICRISAT, 1983; Hargrove and John, 1982), especially publications addressed to both technical and non-technical audiences. These include detailed annual reports with descriptions of technical work, information and research bulletins, general guides, newsletters, and illustrated research highlights (ICRISAT, 1983).

In the International Potato Center (CIP) in Lima, Peru, communication services include the use of printed matter, visual aids and seminars conducted at the Center for visitors. The main library in Lima also provides services to all CIP staff and to Visiting Scientists (CIP, 1982). The West African Rice Development Association (WARDA) cooperates with many institutes within and outside its region. The Center exchanges scientists and germplasm with the Bangladesh Rice Research Institute (BRRI). The agreement between the Catholic University--Louvain, Belgium, (UCL) to study the use of Azolla and blue-green algae as a source of nitrogen for rice production became operational in 1980 (WARDA, 1980).

The International Livestock Center for Africa (ILCA) provides training programs with the aim of increasing the knowledge and skills of African scientists in livestock research and production techniques. The ILCA's Documentation Center provides a service unique in sub-Saharan Africa--a comprehensive library in the livestock

field, together with a microfiche service concentration on inconvenient literature and a computerized information storage and retrieval system. These services are offered not only to ILCA's members, but also to researchers throughout the region to exchange experiences and results.

Young researchers come to IRRI from all over the region to study everything from plant breeding to rural sociology, with concentration on the principles of crop production, pest management, and agricultural economics. And they return home equipped to adopt and put into practice the best of both modern and traditional cropping systems techniques (IDRC, 1983).

Establishment of information systems by the International Board for Plant Genetic Resources (IBPGR) for documentation of plant genetic resources is an essential complement to the international efforts of the Board in ensuring the collection and conservation of plant genetic resources. These collection and conservation efforts would have little value if the collection were not adequately documented and if this information were not readily accessible to the users; first for monitoring the collection and conservation processes and second to communicate information, thereby facilitating the distribution and use of material on request (IBPGR, 1980).

In 1982, the International Maize and Wheat Improvement Center (CIMMYT) published 40 new titles and distributed them according to interest areas within a mailing list of 4,500

names. Many other papers were prepared for presentation at international and national meetings, most of them being published elsewhere. A new computerized mailing list system was put into operation in 1982. This system allows CIMMYT to better target its communication with key client groups. In addition, plans were formalized to expand significantly CIMMYT's activities in the preparation of training materials. A major objective of the proposed instructional materials will be to backstop national program efforts to develop their own capacity for in-service training of their personnel. CIMMYT's large training alumni network (numbering over 2,500 individuals from 86 countries) will play a key role in increasing the multiplier effect of CIMMYT's training efforts in Mexico and elsewhere (CIMMYT, 1982).

The International Food Policy Research Institute (IFPRI) conducts research on the world food problem through an integrated approach examining the interrelationships over all economic growth, and social welfare. IFPRI's approach recognizes that the world food problem reflects differing food problems among and within countries. In some countries food problems exist because of slow production growth. In others it is caused by inadequate distribution resulting from poor roads and transportation facilities. Food problems exist because the poor lack opportunities for employment and also lack purchasing power (IFPRI, 1982).

In 1982, IFPRI strengthened its outreach effort by creating a policy seminar program. Its purpose is to

facilitate the flow of policy-relevant information generated by IFPRI research to decision makers in developing countries. Various meeting formats are employed, with particular emphasis on seminars that provide an opportunity for personal communication between IFPRI researchers and individuals who formulate and implement food and nutrition policies in these countries. During 1982 extensive preparations were made for a series of seminars on agricultural price policies, trade and exchange rate issues, food subsidy programs, and food aid policy issues. In-house seminars are held periodically to discuss recently completed IFPRI studies or research in progress. They are attended by Washington scholars and visiting officials. Informal meetings involving IFPRI researchers and food policy experts from the developing countries numbered 20 during 1982 (IFPRI, 1982).

The International Rice Research Institute (IRRI) in the Philippines utilizes the Berlo model for communication in dissemination of their information. This model requires that there must be a "message" to be sent, a "sender", a "channel" for carrying the message, and a "receiver" of the message. As an example, an IRRI scientist is a "sender". The "message" could be success with a new variety resistant to some disease. The "channel" may be the IRRI Annual Report or some other publication, and the "receiver" is another scientist (Haws, 1982).

In a study designed to determine the educational and

training needs and communication priorities in Asian agricultural research and educational organizations, Haws (1983) found that 90 percent of the respondents indicated that a lack of adequately trained staff was a major constraint to their information programs. Other major constraints included inadequate financial support, lack of equipment, unavailability of professional staff and lack of in-service training (Gowdar et al., 1983).

Informal and structured collaboration is becoming increasingly common in international agricultural research. A network approach to research generally reduces costs, minimizes duplication, and boosts efficiency. Collaborative teams, sometimes involving hundreds of scientists in dozens of countries, have been formed to tackle numerous constraints to boosting food production. Networks have been established to test crop germplasm over a broad range of environments, explore ways of boosting the efficiency of fertilizer use, upgrade disease resistance in livestock, and identify socioeconomic obstacles to improved agricultural output. Benefits of networking are especially valuable to countries with limited funds and scientific manpower (Plucknett et al. 1984).

CHAPTER III

METHODOLOGY

Introduction

This Chapter presents methods used and procedures followed in conducting the study. It was designed to deal with the population for the study, development of the questionnaires and/or instruments, and describe the handling and administering of the questionnaires as well as treatment of the data.

Population

The study population included (1) functioning personnel in a total of 13 International Agricultural Research Centers and (2) International Undergraduate and Graduate International Students studying Agriculture at Oklahoma State University.

Total population for Group I consisted of 1,356 individuals. These were categorized into six subgroups according to the function of the position which they occupied. Categorization for the six subgroups can be seen in Table II. Due to the limitations of widespread geographical location and the necessity of conducting data gathering by mail, the use of random sampling was decided

TABLE II
DISTRIBUTION OF PERSONNEL BY FUNCTIONAL CATEGORIES OF THE
THIRTEEN INTERNATIONAL AGRICULTURAL RESEARCH CENTERS
(IARC's) IN GROUP I

Board & Staff By Category	Number of Board and Staff Serving in Each IRAC													TOTAL
	CIAT	CIP	CIMMYT	ICARDA	ICRISAT	IITA	ILCA	IRRI	ILRAD	IFPRI	ISNAR	IBPGR	WARDA	
I. Board of Trustees	17	10	15	16	15	11	13	17	12	16	15	17	15	189
II. General Directors	2	2	2	3	1	2	2	3	1	2	1	2	1	24
III. Research Scientists	106	81	43	50	128	69	26	47	69	37	13	6	27	702
IV. International Cooperation & Outreach	67	19	36	11	27	24	42	31	0	0	1	11	10	279
V. Visiting Scientists & Post- Doctoral Fellows	15	6	9	3	2	1	3	11	21	5	0	0	0	76
VI. Communication, Information & Library/Documentation	23	10	3	2	15	10	6	5	4	6	2	0	0	86
TOTAL	230	128	108	85	188	117	92	114	107	66	32	36	53	1356

upon.

It was recognized that members of certain groups occupied positions which made them more knowledgeable and experienced in terms of dissemination. The sample size was determined in order to use selected percentages of respondent groups and varied among subgroups. This decision was prompted largely by careful analysis and assessment of the experience, responsibilities, and functions of respondents in terms of dissemination and distributions of research findings. The number selected for each of the subgroups comprising Group I is shown in Table III. Examination of data received with regard to Center staff clearly revealed that responsibilities and assignments were such as to provide homogeneity. Therefore, for purposes of the study, they were considered as a group.

Total population of Group II consisted of all International Undergraduate and Graduate International Students studying Agriculture during the Spring semester of 1984 at Oklahoma State University (see Table IV). The total population of Group II consisted of 194 individuals. As presented in Table III, no random sampling was made for Group II since all students were included as respondents.

Instrument

A questionnaire was chosen for use in this study because it was felt to be convenient for respondents. It was also felt less expensive and considered reliable.

TABLE III
ORIGINAL POPULATION PARAMETER AND SAMPLE SIZE

Group	Category	Total Population	Sample size	Sample Percentage
I.	A. Board of Trustees	189	65	34
	B. General Directors	24	13	55
	C. Research Scientists	702	78	11
	D. International Cooperation and Outreach	279	61	22
	E. Visiting Scientists and Post-doctoral fellows	76	27	35
	F. Communication, Information & Library/Documentation	86	51	60
	Total	1356	295	
II.	A. Undergraduate Students	76	76	100
	B. Graduate Students	118	118	100
	Total	194	194	
	Grand Total	1550	489	

TABLE IV
INTERNATIONAL STUDENTS IN DIVISION OF AGRICULTURE,
FEB. 29, 1984

Countries	F/S*	J/S**	Sub- total	MS	Ph.D	Sub- total	Total
Australia				1		1	1
Bangladesh					2	2	2
Botswana		1	1				1
Brazil				1	2	3	3
Cameroon				1	1	2	2
Canada		1	1		1	1	2
Chile	1		1		1	1	2
Colombia	2	3	5		2	2	7
Costa Rica					1	1	1
El Salvador		1	1				1
Ethiopia		1	1	2	2	4	5
Finland		2	2				2
Gambia	2		2				2
Ghana					1	1	1
Greece				1		1	1
Guatemala	1	1	2				2
Honduras	1		1				1
Hong Kong					1	1	1
India				2	2	4	4
Indonesia					3	3	3
Iran		10	10	4	4	8	18
Iraq				2	6	8	8
Jamaica		1	1	1	2	3	4
Japan				1		1	1
Kenya					3	3	3
Korea				1	3	4	4
Kuwait					1	1	1
Lebanon		1	1				1
Libya				1	1	2	2
Malaysia	12	7	19	1	1	2	23
Malawi				1		1	1
Mali					1	1	1
Mauritania		2	2				2
Mexico	1	1	2	1	2	3	5
Morocco				1	1	2	2
Nepal				1	2	3	3
Netherlands					1	1	1
Niger		1	1				1
Nigeria	1	6	7	4	2	6	13
Norway		1	1				1
Pakistan					3	3	3
Peru				1		1	1
Philippines				1	1	2	2

TABLE IV (Continued)

Countries	F/S*	J/S**	Sub- total	MS	Ph.D	Sub- total	Total
Rep. of China					5	5	5
Saudi Arabia				2	4	6	6
Somalia		1	1	1		1	2
South Africa					1	1	1
Sudan					1	1	1
Syria					1	1	1
Tanzania					1	1	1
Thailand					7	7	7
Tunisia				1	1	2	2
United Kingdom					1	1	1
Venezuala	4	9	13	5	3	8	21
Zambia	1		1				1
TOTAL	26	50	76	39	79	118	194

* Freshman and Sophomore.

** Junior and Senior.

Each respondent received an explanatory statement by mail with the questionnaire in the hope that most, if not all, of the questionnaires would be completed and returned.

The questionnaire was developed with the help of the advisory committee members. It was pretested by distributing copies to a number of International students studying Agriculture and also non-Agricultural students. The questionnaire was then revised using the recommendations made by the pretested students and the advisory committee members.

The revised questionnaire which contained 16 strategy statements was divided into three columns. The first column was designed to deal with the extent to which IARC's presently used the identified dissemination methods or techniques to provide such information and findings to farmers and producers. The second column of the questionnaire called for the respondents to present their judgements as to the effectiveness of the dissemination methods presently employed by IARC's. The third column on the questionnaire provided for the respondents to present their judgements as to anticipated effectiveness of the dissemination methods if fully implemented.

A package containing a number of questionnaires was mailed to each Center Director not later than June of 1984. Each Center Director made a random distribution of questionnaires to his or her staff members as respondents using an alphabetical listing of present workers.

Using a list composed of International students studying Agriculture at OSU in Spring of 1984, each of the 76 Undergraduate Students and each of the 118 Graduate Students received a questionnaire by mail prior to April 15, 1984.

Data Treatment

Scores given by each respondent for each question on the instrument schedule were determined as well as mean scores for each group and subgroup. Comparisons were made and appropriate statistical treatments applied as needed.

Data were analyzed to provide an overview of the judgements of both the Center staff and International Graduate and Undergraduate Students studying Agriculture at Oklahoma State University. To provide for comparative treatment of data, numerical values were assigned to the response categories. For example, as shown in Table V, a value of "5" was assigned for the responses of "highly effective" and "fully used." This can be compared to a value of "1" for the responses of "not effective" and "not used."

Table V
 ABSOLUTE LIMITS FOR USE IN ESTABLISHING GROUP
 MEAN SCORES FOR QUESTIONNAIRES

Judging Degree	Numbers Offered for Response	Absolute Limits
Highly Effective (HE) or Fully Used (FU)	5	4.5 - 5.00
Readily Effective (RE) or Frequently Used (FQ)	4	3.5 - 4.49
Moderately Effective (ME) or Moderately Used (MU)	3	2.5 - 3.49
Slightly Effective (SE) or Only Slightly Used (SU)	2	1.5 - 2.49
Not Effective (NE) or Not Used (NU)	1	1.0 - 1.49

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

This chapter was prepared in keeping with the major purpose of the study to obtain and analyze perceptions of (1) functioning personnel at the 13 International Agricultural Research Centers (IARC's) and (2) International students studying Agriculture at Oklahoma State University (OSU) as to how the agricultural research findings from IARC's can most effectively be disseminated.

Therefore, this Chapter describes, analyzes, and compares collected data in keeping with the objectives previously outlined in this study. The tables included in this Chapter were designed to aid in achieving the purpose of the study.

Population for the Study

The population in this study consisted of 1,550 individuals, including 1,356 persons functionally employed in a total of 13 IARC's as well as 76 International Undergraduate Students and 118 International Graduate Students studying Agriculture at OSU in the Spring of 1984. The sample size from the IARC's was 295 individuals and was

stratified to include 65 Board of Trustee Members, 13 Director Generals, 78 Research Scientists, 27 Visiting Scientists and Postdoctoral Fellows, and 51 Communication, Information, and Library/Documentation Specialists. Examination of data received with regard to Center staff clearly revealed that responsibilities and assignments were such as to provide homogeneity. Therefore, for purposes of this study, they were considered as a single group.

Of the 489 survey instruments, 135 (27.6 %) valid responses were received by the end of December, 1984. As shown in Table VI, 86 questionnaires (29.2 %) were returned from individuals serving in the several capacities in the IARC's and 49 (25.3 %) from OSU International students. The number of respondents in each of the groups were slightly varied as can be seen through examination of data shown in the respective tables.

Findings of the Study

The findings of the study were presented in eight major sections which comprised Table VII through Table XIV. Division into the eight sections was based on the reporting of the eight responding groups.

TABLE VI

NUMBER OF RESPONSES SECURED FROM EACH OF THE SIX IARC GROUPS
AND FROM TWO INTERNATIONAL STUDENT GROUPS AT OSU

Respondent Groups	Number of Questionnaires Distributed	Number Responding	Percentage (%) Responding
Board of Trustees	65	16	24.6
General Directors	13	2	15.4
Research Scientists	78	31	39.7
Members of International Cooperation and Outreach	61	20	32.8
Visiting Scientists and Postdoctoral Fellows	27	2	7.4
Officers of Communication, Information, and Library/Documentation	51	15	29.4
Sub Total	295	86	29.2
Undergraduate Students	76	10	13.2
Graduate Students	118	39	33.1
Sub Total	194	49	25.3
Total	489	135	27.6

TABLE VII
PERCEPTIONS BY IARC BOARD OF TRUSTEES AS TO USAGE AND
EFFECTIVENESS

Dissemination Strategies, Methods, and/or Avenues for Getting Information from Center to Farmers and/or Food Producers	Extent of Present Usage				Effectiveness of Present Usage				Anticipated Effectiveness if Fully Implemented			
	N ¹	V	M	R	N	V	M	R	N	V	M	R
1. Course work at universities	14	MU	2.57	9	13	SE	2.46	11	15	ME	3.26	11
2. Workshops at the Centers	13	FQ	4.30	1	13	RE	4.38	1	14	HE	4.50	1
3. Internships at the Centers	15	FQ	3.93	2	14	RE	3.64	3	14	RE	4.07	3
4. Instruction provided by FAO and UNDP	13	SU	2.23	12	12	SE	2.41	12	12	ME	2.83	15
5. Demonstrations provided by PVO's	13	SU	2.07	13	16	SE	2.31	13	14	ME	3.35	9
6. Informing government officials about IARC's	14	SU	2.42	10	13	ME	3.30	4	13	ME	3.38	8
7. Primary and secondary schools informed of IARC's work	11	NU	1.45	15	11	SE	2.00	15	13	ME	3.07	14
8. Dispersion of research needs in developing nations	13	SU	2.38	11	13	ME	2.92	9	13	ME	3.23	13
9. Specialists to provide presentations and demonstrations	13	MU	3.30	3	14	RE	3.78	2	13	RE	4.15	2
10. Textbooks by IARC staff for use in universities	14	MU	2.85	8	14	ME	3.14	6	13	RE	3.69	6
11. Extension personnel providing instruction to farmers	11	MU	3.09	4	12	ME	3.00	8	12	RE	3.83	4
12. Informing research personnel other than IARC's	12	MU	3.00	6	12	ME	3.16	5	14	ME	3.35	9
13. Adult villagers in training at IARC's	11	SU	1.90	14	12	SE	2.08	14	12	ME	3.25	12
14. Joint conferences and planning sessions	13	MU	3.00	6	13	ME	2.76	10	14	RE	3.71	5
15. Trial plots at provincial level	13	MU	3.07	5	12	ME	3.08	7	13	RE	3.69	6
TOTAL MEAN (N=65)		MU	2.80			ME	2.98			RE	3.57	

¹ N=Number. V=Value categories as interpreted in Table V. M=Mean. R=Rank.

TABLE VIII
PERCEPTIONS BY IARC GENERAL DIRECTORS AS TO USAGE AND
EFFECTIVENESS

Dissemination Strategies, Methods, and/or Avenues for Getting Information from Center to Farmers and/or Food Producers	Extent of Present Usage				Effectiveness of Present Usage				Anticipated Effectiveness if Fully Implemented			
	N ¹	V	M	R	N	V	M	R	N	V	M	R
	1. Course work at universities	2	MU	2.50	6	2	ME	2.50	15	2	RE	3.50
2. Workshops at the Centers	2	FQ	4.00	2	2	HE	4.50	2	2	HE	4.50	2
3. Internships at the Centers	2	FQ	3.50	4	2	HE	4.50	2	2	HE	4.50	2
4. Instruction provided by FAO and UNDP	2	FQ	4.00	2	1	ME	3.00	9	1	ME	3.00	11
5. Demonstrations provided by PVO's	2	SU	1.50	13	2	ME	3.00	9	2	ME	3.00	11
6. Informing government officials about IARC's	2	FU	4.50	1	2	ME	3.00	9	2	ME	3.00	11
7. Primary and secondary schools informed of IARC's work	2	NU	1.00	14	1	HE	4.50	2	1	RE	4.00	4
8. Dispersion of research needs in developing nations	2	SU	2.00	10	2	RE	3.50	8	2	RE	4.00	4
9. Specialists to provide presentations and demonstrations	2	SU	2.00	10	2	HE	4.50	2	2	HE	5.00	1
10. Textbooks by IARC staff for use in universities	2	MU	3.00	5	2	ME	3.00	9	2	RE	3.50	8
11. Extension personnel providing instruction to farmers	2	MU	2.50	6	2	ME	3.00	9	2	RE	4.00	4
12. Informing research personnel other than IARC's	1	SU	2.00	10	2	RE	4.00	6	1	ME	3.00	11
13. Adult villagers in training at IARC's	2	NU	1.00	14	1	RE	4.00	6	1	SE	2.00	15
14. Joint conferences and planning sessions	2	MU	2.50	6	1	HE	5.00	1	1	RE	4.00	4
15. Trial plots at provincial level	2	MU	2.50	6	1	ME	3.00	9	2	RE	3.50	8
TOTAL MEAN (N=13)		MU	2.58			RE	3.58			RE	3.72	

¹ N=Number. V=Value categories as interpreted in Table V. M=Mean. R=Rank.

TABLE IX
PERCEPTIONS BY IARC RESEARCH SCIENTISTS AS TO USAGE AND EFFECTIVENESS

Dissemination Strategies, Methods, and/or Avenues for Getting Information from Center to Farmers and/or Food Producers	Extent of Present Usage				Effectiveness of Present Usage				Anticipated Effectiveness if Fully Implemented			
	N ¹	V	M	R	N	V	M	R	N	V	M	R
1. Course work at universities	31	SU	2.29	10	27	ME	2.66	10	28	RE	3.60	10
2. Workshops at the Centers	31	FQ	3.61	2	31	ME	3.35	2	29	RE	3.82	9
3. Internships at the Centers	26	MU	3.38	4	26	ME	3.34	3	24	RE	3.88	7
4. Instruction provided by FAO and UNDP	29	SU	1.86	14	22	SE	2.45	11	22	ME	3.22	14
5. Demonstrations provided by PVO's	28	SU	1.89	13	23	SE	2.43	12	23	ME	3.38	13
6. Informing government officials about IARC's	31	FQ	3.80	1	31	ME	2.93	8	31	RE	3.93	6
7. Primary and secondary schools informed of IARC's work	30	NU	1.23	15	23	NE	1.47	15	26	ME	2.80	15
8. Dispersion of research needs in developing nations	28	SU	2.14	11	24	SE	2.37	13	25	ME	3.40	11
9. Specialists to provide presentations and demonstrations	31	FQ	3.51	3	31	ME	3.16	5	29	RE	3.86	8
10. Textbooks by IARC staff for use in universities	30	SU	2.33	9	28	ME	2.82	9	25	RE	4.12	4
11. Extension personnel providing instruction to farmers	25	MU	2.52	8	29	ME	2.96	6	27	RE	4.37	1
12. Informing research personnel other than IARC's	31	MU	3.32	5	31	RE	3.61	1	29	RE	4.37	1
13. Adult villagers in training at IARC's	30	SU	1.90	12	27	SE	1.92	14	28	ME	3.39	12
14. Joint conferences and planning sessions	30	MU	2.60	7	29	ME	2.96	6	28	RE	4.07	5
15. Trial plots at provincial level	27	MU	2.74	6	29	ME	3.17	4	27	RE	4.14	3
TOTAL MEAN (N=78)		MU	2.62			ME	2.82			RE	3.78	

¹ N=Number. V=Value categories as interpreted in Table V. M=Mean. R=Rank.

TABLE X
PERCEPTIONS BY IARC MEMBERS OF INTERNATIONAL COOPERATION AND
OUTREACH AS TO USAGE AND EFFECTIVENESS

Dissemination Strategies, Methods, and/or Avenues for Getting Information from Center to Farmers and/or Food Producers	Extent of Present Usage				Effectiveness of Present Usage				Anticipated Effectiveness if Fully Implemented			
	N	V ¹	M	R	N	V	M	R	N	V	M	R
1. Course work at universities	16	MU	2.88	10	14	ME	2.50	12	16	RE	3.56	12
2. Workshops at the Centers	19	FQ	3.89	1	19	RE	3.84	2	17	HE	4.71	1
3. Internships at the Centers	19	FQ	3.63	3	18	RE	3.66	3	17	RE	4.23	5
4. Instruction provided by FAO and UNDP	17	SU	2.47	12	16	ME	3.00	9	16	ME	3.43	14
5. Demonstrations provided by PVO's	17	SU	1.58	14	15	SE	2.33	14	17	RE	4.05	6
6. Informing government officials about IARC's	19	MU	3.42	4	16	ME	3.31	5	16	RE	4.00	8
7. Primary and secondary schools informed of IARC's work	17	NU	1.17	15		SE	1.62	15	17	ME	3.00	15
8. Dispersion of research needs in developing nations	17	MU	2.67	11	14	ME	2.78	11	14	RE	3.57	11
9. Specialists to provide presentations and demonstrations	14	MU	3.28	7	19	SE	2.47	13	16	RE	4.37	4
10. Textbooks by IARC staff for use in universities	19	MU	3.10	8	16	ME	3.12	8	17	RE	4.05	6
11. Extension personnel providing instruction to farmers	19	MU	2.94	9	19	ME	3.26	6	18	RE	3.88	9
12. Informing research personnel other than IARC's	20	MU	3.30	6	18	RE	3.55	4	17	HE	4.64	2
13. Adult villagers in training at IARC's	17	SU	1.70	13	13	ME	2.92	10	17	ME	3.47	13
14. Joint conferences and planning sessions	17	FQ	3.76	2	16	ME	3.25	7	17	RE	3.76	10
15. Trial plots at provincial level	17	MU	3.41	5	16	RE	3.93	1	16	HE	4.62	3
TOTAL MEAN (N=61)		MU	2.90			ME	3.07			RE	3.96	

¹ N=Number. V=Value categories as interpreted in Table V. M=Mean. R=Rank.

TABLE XI
PERCEPTIONS BY IARC VISITING SCIENTISTS AND POSTDOCTORAL
FELLOWS AS TO USAGE AND EFFECTIVENESS

Dissemination Strategies, Methods, and/or Avenues for Getting Information from Center to Farmers and/or Food Producers	Extent of Present Usage				Effectiveness of Present Usage				Anticipated Effectiveness if Fully Implemented			
	N ¹	V	M	R	N	V	M	R	N	V	M	R
1. Course work at universities	2	FQ	3.50	3	2	ME	2.50	4	2	ME	3.00	7
2. Workshops at the Centers	2	FQ	4.00	1	2	ME	2.50	4	1	ME	3.00	7
3. Internships at the Center	2	FQ	4.00	1	2	ME	3.00	1	2	ME	3.00	7
4. Instruction provided by FAO and UNDP	0	NU	0.00	15	0	NE	0.00	15	0	NE	0.00	15
5. Demonstrations provided by PVO's	2	MU	3.00	7	2	SE	2.00	8	2	ME	2.50	13
6. Informing government officials about IARC's	2	FQ	3.50	3	2	SE	2.00	8	2	ME	2.50	13
7. Primary and secondary schools informed of IARC's work	2	SU	1.50	12	2	SE	1.50	12	2	ME	3.00	7
8. Dispersion of research needs in developing nations	2	MU	2.50	9	2	SE	1.50	12	2	ME	3.00	7
9. Specialists to provide presentations and demonstrations	2	FQ	3.50	3	2	ME	3.00	1	2	HE	4.50	1
10. Textbooks by IARC staff for use in universities	2	MU	2.50	9	2	SE	2.00	8	2	RE	3.50	6
11. Extension personnel providing instruction to farmers	2	SU	1.50	12	1	SE	1.50	12	2	RE	4.00	2
12. Informing research personnel other than IARC's	2	MU	3.00	7	2	ME	2.50	4	2	RE	4.00	2
13. Adult villagers in training at IARC's	2	SU	1.50	12	1	ME	3.00	1	2	RE	4.00	2
14. Joint conferences and planning sessions	2	MU	2.50	9	1	SE	2.00	8	2	ME	3.00	7
15. Trial plots at provincial level	2	FQ	3.50	3	2	ME	2.50	4	2	RE	4.00	2
TOTAL MEAN (N=27)		MU	2.86			SE	2.32			ME	3.37	

¹ N=Number. V=Value categories as interpreted in Table V. M=Mean. R=Rank.

TABLE XII
 PERCEPTIONS BY IARC OFFICERS OF COMMUNICATION, INFORMATION,
 AND LIBRARY/DOCUMENTATION AS TO USAGE AND EFFECTIVENESS

Dissemination Strategies, Methods, and/or Avenues for Getting Information from Center to Farmers and/or Food Producers	Extent of Present Usage				Effectiveness of Present Usage				Anticipated Effectiveness if Fully Implemented			
	N ¹	V	M	R	N	V	M	R	N	V	M	R
	1. Course work at universities	15	SU	1.80	13	9	SE	2.00	12	14	RE	3.57
2. Workshops at the Centers	15	FQ	3.50	1	14	ME	3.42	3	14	RE	4.07	4
3. Internships at the Centers	15	MU	3.06	3	13	RE	3.69	2	13	RE	4.00	6
4. Instruction provided by FAO and UNDP	14	SU	2.14	10	11	SE	2.45	10	15	ME	3.26	11
5. Demonstrations provided by PVO's	12	SU	1.75	14	7	ME	2.85	7	15	ME	3.13	12
6. Informing government officials about IARC's	14	MU	2.92	5	12	ME	2.83	8	14	RE	3.92	7
7. Primary and secondary schools informed of IARC's work	15	MU	3.06	3	9	NE	1.33	15	12	ME	2.91	14
8. Dispersion of research needs in developing nations	13	MU	2.76	6	10	SE	2.40	11	12	ME	2.91	14
9. Specialists to provide presentations and demonstrations	15	MU	3.13	2	12	ME	3.41	4	15	RE	4.33	3
10. Textbooks by IARC staff for use in universities	15	MU	2.60	9	9	RE	3.77	1	14	RE	3.85	9
11. Extension personnel providing instruction to farmers	15	SU	2.06	11	10	ME	2.80	9	11	RE	4.42	1
12. Informing research personnel other than IARC's	14	MU	2.64	8	11	ME	3.18	5	15	RE	4.40	2
13. Adult villagers in training at IARC's	12	SU	1.75	14	8	NE	1.35	14	13	RE	3.92	7
14. Joint conferences and planning sessions	14	SU	1.92	12	11	SE	2.00	12	15	ME	3.13	12
15. Trial plots at provincial level	13	MU	2.76	6	11	ME	2.90	6	15	RE	4.06	5

TOTAL MEAN (N=51)

¹ N=Number. V=Value categories as interpreted in Table V. M=Mean. R=Rank.

TABLE XIII
PERCEPTIONS BY INTERNATIONAL UNDERGRADUATE STUDENTS
AS TO USAGE AND EFFECTIVENESS

Dissemination Strategies, Methods, and/or Avenues for Getting Information from Center to Farmers and/or Food Producers	Extent of Present Usage				Effectiveness of Present Usage				Anticipated Effectiveness if Fully Implemented			
	N ¹	V	M	R	N	V	M	R	N	V	M	R
1. Course work at universities	10	MU	3.00	3	10	SE	2.10	12	10	RE	3.90	6
2. Workshops at the Centers	10	MU	3.20	1	10	ME	2.70	6	10	RE	3.90	6
3. Internships at the Centers	10	MU	2.50	10	10	ME	2.50	8	10	RE	3.70	10
4. Instruction provided by FAO and UNDP	10	MU	2.90	5	9	SE	2.44	10	10	ME	3.30	14
5. Demonstrations provided by PVO's	10	MU	2.80	7	10	ME	2.60	7	10	ME	3.40	13
6. Informing government officials about IARC's	10	MU	2.70	9	10	SE	2.10	12	10	RE	3.70	10
7. Primary and secondary schools informed of IARC's work	10	SU	1.60	15	10	SE	1.50	15	9	ME	3.22	15
8. Dispersion of research needs in developing nations	10	SU	2.10	12	10	SE	1.80	14	10	RE	4.10	2
9. Specialists to provide presentations and demonstrations	10	MU	2.80	7	10	ME	2.50	8	10	RE	3.50	12
10. Textbooks by IARC staff for use in universities	10	MU	2.50	10	10	ME	2.80	4	10	RE	4.10	2
11. Extension personnel providing instruction to farmers	10	SU	2.10	12	10	ME	2.80	4	10	RE	4.30	1
12. Informing research personnel other than IARC's	10	MU	3.00	3	10	ME	2.90	3	10	RE	3.90	6
13. Adult villagers in training at IARC's	10	SU	2.00	14	10	SE	2.40	11	10	RE	4.10	2
14. Joint conferences and planning sessions	10	MU	2.90	5	10	ME	3.10	2	10	RE	4.10	2
15. Trial plots at provincial level	10	MU	3.10	2	10	ME	3.30	1	10	RE	3.90	6
TOTAL MEAN (N=76)		MU	2.65			ME	2.50			RE	3.81	

¹ N=Number. V=Value categories as interpreted in Table V. M=Mean. R=Rank.

TABLE XIV
PERCEPTIONS BY INTERNATIONAL GRADUATE STUDENTS AS TO USAGE
AND EFFECTIVENESS

Dissemination Strategies, Methods, and/or Avenues for Getting Information from Center to Farmers and/or Food Producers	Extent of Present Usage				Effectiveness of Present Usage				Anticipated Effectiveness if Fully Implemented			
	N ¹	V	M	R	N	V	M	R	N	V	M	R
1. Course work at universities	37	SU	2.32	11	37	SE	2.45	12	37	ME	3.42	13
2. Workshops at the Centers	36	MU	2.63	5	36	ME	2.77	6	38	RE	4.02	4
3. Internships at the Centers	35	MU	2.54	8	35	ME	2.80	5	36	RE	4.11	3
4. Instruction provided by FAO and UNDP	36	MU	2.61	6	35	ME	2.82	4	36	RE	3.77	9
5. Demonstrations provided by PVO's	36	SU	2.11	13	35	SE	2.00	14	35	ME	3.02	14
6. Informing government officials about IARC's	38	MU	2.74	2	35	ME	2.77	6	38	RE	3.57	10
7. Primary and secondary schools informed of IARC's work	37	NU	1.40	15	36	SE	1.75	15	36	ME	2.91	15
8. Dispersion of research needs in developing nations	35	MU	2.57	7	35	ME	2.68	9	37	RE	3.54	11
9. Specialists to provide presentations and demonstrations	34	MU	2.67	4	33	ME	2.72	8	35	ME	3.45	12
10. Textbooks by IARC staff for use in universities	37	MU	3.35	1	36	ME	2.61	11	37	RE	3.91	6
11. Extension personnel providing instruction to farmers	37	SU	2.43	10	37	ME	2.89	3	37	RE	4.21	2
12. Informing research personnel other than IARC's	36	SU	2.47	9	37	ME	3.13	2	37	RE	4.02	4
13. Adult villagers in training at IARC's	37	SU	1.94	14	38	SE	2.36	13	38	RE	3.81	8
14. Joint conferences and planning sessions	37	OS	2.29	12	37	ME	2.64	10	39	RE	3.87	7
15. Trial plots at provincial level	37	MU	2.70	3	37	ME	3.24	1	37	RE	4.40	1
TOTAL MEAN (N=118)		SU	2.40			ME	2.65			RE	3.75	

¹ N=Number. V=Value categories as interpreted in Table V. M=Mean. R=Rank.

Perception by the IARC Board of Trustees
as to the Extent of Present Usage and
as to the Present and Future Effect-
iveness of Dissemination Strategies

Means of responses indicating perceptions of IARC's Board of Trustees regarding "extent of present usage" of disseminating methods in agricultural research findings and "the present and anticipated future effectiveness" is presented in Table VII. These responses from the Board of Trustees showed that the combined 15 strategies fell into the "moderately used" ($\bar{x} = 2.80$) category in terms of the "extent of present usage." Among the 15 disseminating methods, the Board of Trustees placed the two methods: "workshops at the Centers" and "internships at the Centers." Both of these methods fell in the "frequently used" category with mean scores of 4.30 and 3.93, respectively. These respondents perceived certain dissemination strategies to be in the "not used" category. Specifically, the method: "primary and secondary schools informed of IARC's work" received the lowest mean score ($\bar{x} = 1.45$) among the 15 selected strategies. Collection of data revealed that seven of the 15 methods were "moderately used" while five were "only slightly used."

When the combined 15 strategies were considered in terms of "effectiveness of present usage," those individuals responding perceived them to be "moderately effective" ($\bar{x} = 2.98$). Responses from the Board of Trustees highlighted the

method: "workshops at the Centers" which fell into the "readily effective" (\bar{x} = 4.38). Two other strategies: "specialists to provide presentations and demonstrations" and "internships at the Centers" also fell into the "readily effective" category which showed mean scores of 3.78 and 3.64, respectively. Conversely, the Trustees judged the method: "primary and secondary schools informed of the IARC's work" which fell into the "slightly effective" category and ranked it lowest among the 15 strategies. In fact, seven of the 15 methods fell into the "moderately effective" and four into the "slightly effective" category.

In regard to assessment of "anticipated effectiveness when fully implemented," responses from the Board of Trustees indicated that they considered the overall 15 strategies to be in the "readily effective" (\bar{x} = 4.50) category. Nevertheless, the Board of Trustees anticipated the method: "instruction provided by FAO and UNDP" to be in the "moderately effective" and thereby rated it the lowest (\bar{x} = 2.83). Seven of the 15 strategies were rated as "readily effective" and six as "moderately effective."

Perceptions by the IARC General Directors
as to the Extent of Present Usage and as
to the Present and Future Effectiveness
of Dissemination Strategies

Table VIII displays the mean score of perceptions of the General Directors regarding "extent of present usage" of

research information and also perceptions as to present and future effectiveness of selected dissemination methods. With regard to assessment of "extent of present effectiveness," the General Directors perceived the overall 15 strategies to be in the "moderately used" ($\bar{x} = 2.58$) category. They particularly focused upon the method: "informing government officials about IARC's" which fell into the "fully used" ($\bar{x} = 4.50$) category. However, they judged the two methods: "primary and secondary schools informed of IARC's work" and "adult villagers in training at IARC's" both to be in the "not used" category and thereby rated them as the lowest mean scores of the entire study. Three of the 15 selected practices were "frequently used;" five, "moderately used;" and four, "only slightly used."

In regard to assessment of "effectiveness of present usage," the General Directors judged the overall 15 strategies to be "readily effective" ($\bar{x} = 3.58$). They highlighted the method: "joint conferences and planning sessions" which placed it in the "highly effective" ($\bar{x} = 5.00$) category. The highest rated method was followed by four other methods: (1) "workshops at the Centers," (2) "internships at the Centers," (3) "primary and secondary schools informed of IARC's work," and (4) "specialists to provide presentations and demonstrations," which also fell into the "highly effective" ($\bar{x} = 4.50$) category. However, the General Directors judged the method: "course work at colleges or universities" to be "moderately effective," with

a comparatively low mean response ($\bar{x} = 2.50$). Three of the strategies were "readily effective" while six were "moderately effective."

In the case of "anticipated effectiveness when fully implemented," the General Directors perceived the combined 15 methods to be at the "readily effective" ($\bar{x} = 3.72$) level. They placed the method: "specialists to provide presentations and demonstrations" at the "highly effective" ($\bar{x} = 5.00$) level. The highest rated method was followed by two other methods: "workshops at the Centers" and "internships at the Centers" which also fell into the "highly effective" ($\bar{x} = 4.50$) category. On the other hand, one of the lower mean scores of perceptions by the General Directors was given to the method: "adult villagers in training at IARC's" which placed it in the "slightly effective" ($\bar{x} = 2.00$) category. Seven of the strategies were judged "readily effective" while four were judged "moderately effective."

Perceptions by the IARC Research
Scientists as to the Extent of
Present Usage and as to the
Present and Future Effect
iveness of Dissemination
Strategies

Table IX presents mean scores depicting perceptions held by IARC Research Scientists as to "extent of present

usage" in disseminating methods of research findings from IARC's and also judgemental perceptions as to "present and future effectiveness when fully implemented." In terms of the "extent of present usage," the Research Scientists, as a group, considered the entire 15 strategies to be "moderately used" ($\bar{x} = 2.62$). Among the 15 methods, they, as did General Directors, highlighted the method: "informing government officials about IARC's" by placing it in the "frequently used" ($\bar{x} = 3.80$) category. Two other methods: "workshops at the Centers" and "specialists to provide presentations and demonstrations" were placed in the "frequently used" category with 3.61 and 3.51 mean scores, respectively. The Center personnel gave the lowest rank to the method: "primary and secondary schools informed of IARC's work" placing it in the "not used" ($\bar{x} = 1.23$) category, again being in agreement with the General Directors. Five of the 15 methods were "moderately used" while six were "slightly used."

Assesing the "effectiveness of present usage," Research Scientists believed that the strategies employed were "moderately effective" ($\bar{x} = 3.61$). Conversely, they judged the method: "primary and secondary schools informed of IARC's work" as being "not effective" ($\bar{x} = 1.47$). Nine of the strategies were judged "moderately effective" and four were "slightly effective."

In terms of "anticipated effectiveness when fully implemented" of the 15 selected strategies, the respondents

rated them "readily effective" (\bar{x} = 3.78). They highlighted the two disseminating methods: "Extension personnel providing instructions to farmers" and "informing research personnel other than IARC's" as belonging in the "readily effective" (\bar{x} = 4.37) category. Eight other methods also were "readily effective." However, the respondents judged the method: "primary and secondary schools informed of IARC's work" to be "moderately effective." This was the lowest mean score (\bar{x} = 2.80) among the 15 selected practices. The remaining five methods also were "moderately effective."

Perceptions by the IARC International
Cooperation and Outreach Members as
to the Extent of Present Usage and
as to the Present and Future
Effectiveness of Dissemination
Strategies

Data presented in Table X show that "extent of present usage" of the combined 15 selected dissemination methods of research information was regarded as being "frequently used" (\bar{x} = 3.89). This highest rated method was followed by two other methods: "internships at the Centers" and "joint conferences and planning sessions" which were rated as "frequently used" with 3.63 and 3.76 mean scores, respectively. However, these respondents gave the method: "primary and secondary schools informed of IARC's work" a

mean score of 1.17 which placed it in the "not used" category. Eight of the 15 methods were "moderately used" and three were "only slightly used."

Regarding assessment of "effectiveness of present usage" and concerning the 15 methods used, respondents perceived the dissemination methods as being "moderately effective" ($\bar{x} = 3.07$). The highest mean score, 3.93, was given to the method: "trial plots at provincial level" placing it in the "readily effective" category. The respondents also rated three other methods as "readily effective" as can be seen by referring to Table X. On the other hand, they perceived the method: "primary and secondary schools informed of IARC's work" as only "slightly effective" resulting in the lowest mean score of 1.62. The respondents also rated two other methods as "slightly effective" and eight as "moderately effective."

When assessing "anticipated effectiveness if fully implemented" of the combined 15 strategies, the International Cooperation and Outreach members judged them overall as "readily effective" ($\bar{x} = 3.96$) level. They gave the high mean score of 4.62 to each of three methods: (1) "workshops held at the Centers," (2) "informing research personnel other than IARC's," and (3) "trial plots at provincial level." Each of these three methods was assessed as "highly effective." The lowest mean score ($\bar{x} = 3.00$) given by these respondents was assessed to the method "primary and secondary schools informed of IARC's work"

which fell into the "moderately effective" category. Two other items were also perceived as "moderately effective," while the remaining nine items were assessed as "readily effective."

Perceptions by the IARC Visiting
Scientists and Postdoctoral Fellows
as to the Extent of Present Usage
and as to the Present and Future
Effectiveness of Dissemination
Strategies

Value assessments as perceptions of IARC Visiting Scientists and Postdoctoral Fellows are presented in Table XI. Mean responses regarding "extent of present usage" of the combined 15 strategies fell into the "moderately used" ($\bar{x} = 2.86$) category. Respondents from this group also felt that two dissemination methods: "workshops at the Centers" and "internships at the Centers" were "frequently used" and both were given a mean score of 4.00. These highly rated methods were followed by four other methods rated equally with a mean score of 3.50. Nevertheless, the respondents indicated their perceptions by giving a lower mean rating of 1.50 to three methods being "only slightly used." These were (1) "primary and secondary schools informed of IARC's work," (2) "extension personnel providing instruction to farmers," and (3) "adult villagers in training at IARC's." Five of the 15 strategies were "moderately used."

It is considered noteworthy that assessments regarding "effectiveness of present usage" revealed that the combined 15 strategies were perceived overall as "slightly effective" ($\bar{x} = 2.32$) by the Visiting Scientists and Postdoctoral Fellows. The respondents judged that each of three methods: (1) "internship at the Centers," (2) "specialists to provide presentations and demonstrations," and (3) "adult villagers in training at IARC's" fitted equally into the "moderately effective" ($\bar{x} = 3.00$) category and constituted first place among the 15 selected strategies. Four other methods were also rated "moderately effective" with equal mean scores of 2.50. A much lower mean score of 1.50 was given to the three methods: (1) "primary and secondary schools informed of IARC's work," (2) "dispersion of research needs in developing nations," and (3) "Extension personnel providing instruction to farmers." These three methods were assessed by Visiting Scientists and Postdoctoral Fellows as only "slightly effective." The remaining five methods were also judged to be "slightly effective."

With regard to judgement of "anticipated effectiveness when fully implemented," the respondents perceived the combined 15 strategies as promising to be "moderately effective" ($\bar{x} = 3.77$). Among the 15 methods, their responses showed that one method: "specialists to provide presentations and demonstrations" was considered most promising and was anticipated as being "highly effective" ($\bar{x} = 4.50$). Two of the strategies: "instruction and

demonstrations provided by PVO's" and "informing government officials about IARC's" were categorized as only becoming "moderately effective" ($\bar{x} = 2.50$) when fully implemented, thus ranking it lower than the other strategies. Six other methods also were anticipated as "moderately effective" while five were "readily effective."

For unknown reasons, both Visiting Scientists and Postdoctoral Fellows failed to respond to the strategy item: "instruction provided through Food and Agriculture Organization of the United Nations (FAO) and the United Nations Development Program (UNDP)" both as to "extent of present usage" and as to "present and future effectiveness."

Perceptions by the IARC Officers of
Communication, Information, and
Library/Documentation as to the
Extent of Present usage and as
to the Present and Future
Effectiveness of Dissem-
ination Strategies

As shown on examination of data presented in Table XII, the Officers of Communication, Information, and Library/Documentation considered that the combined 15 practices were "moderately used" ($\bar{x} = 2.55$). Responses to the strategy of "extent of present usage" again showed that the method "workshops at the Centers" was recognized as "frequently used" ($\bar{x} = 3.50$). A much lower mean responses of 1.75 was

given to each of the two methods: "instruction and demonstrations provided by PVO's" and "adult villagers in training at IARC's," which placed them into "only slightly used" category. Three other items also were perceived as "only slightly used" while eight were "moderately used."

With regard to assessment of "effectiveness of present usage," the respondents perceived the combined 15 strategies to be "moderately effective" ($\bar{x} = 2.76$). It is interesting that the respondents strongly judged the method: "textbooks by IARC staff for use in colleges and universities" to be in the "readily effective" ($\bar{x} = 3.77$) category. This highest rated method was followed by the method: "workshops at the Centers" which also was considered "readily effective" ($\bar{x} = 3.69$). Yet, respondents perceived as "not effective" ($\bar{x} = 1.33$ and 1.35 , respectively) the two methods: "primary and secondary schools informed of IARC's work" and "adult villagers in training at IARC's." Eight of the 15 strategies were "moderately effective" while four were "slightly effective."

Judgemental perceptions regarding "anticipated effectiveness when fully implemented" showed that the respondents were expecting the combined 15 strategies to become "readily effective" ($\bar{x} = 3.74$). It is also interesting to find that they anticipated for the future relatively higher effectiveness for two methods: "Extension personnel providing instructions to farmers" and "informing research personnel other than IARC's." Mean scores ($\bar{x} = 4.00$

and 4.42, respectively) of the two methods were sufficiently high to place them in the "readily effective" category. Eight other strategies also were perceived as "readily effective." However, "anticipated future effectiveness" perceived as being only "moderately effective" ($\bar{x} = 2.91$) was projected for two methods: "primary and secondary schools informed of IARC's work" and "dispersion of research needs in developing nations." The remaining three methods also were assessed promising to be "moderately effective."

Perceptions by OSU International
Undergraduate Students Studying
Agriculture as to the Extent of
Present Usage and as to the
Present and Future Effect-
iveness of Dissemination
Strategies

Data presented in Table XIII show preceptions indicated by OSU International Undergraduate Students as to "extent of present usage" of the 15 selected strategies for disseminating agricultural research information as well as "present and anticipated future effectiveness" of these methods. With regard to assessment of "extent of present usage" of the combined 15 strategies, the Undergraduate Students perceived them to be in the "moderately used" ($\bar{x} = 2.65$) category. The specific method: "workshops at the Centers" was recognized by the students as the most used

with a mean score of 3.20 placing it in the "moderately used" category. Ten other of the strategies were also perceived as "moderately used." However, the method: "primary and secondary schools informed of IARC's work" was judged to be "only slightly used" ($\bar{x} = 1.60$). The remaining three items also were perceived as "only slightly used." Under the assessment of "extent of present usage," OSU students perceived strategies, for most parts, as either "moderately used" or "only slightly used."

Student assessment of "effectiveness of present usage" for the combined 15 strategies indicated that they believed them to be "moderately effective" ($\bar{x} = 2.50$). Again, most of the student perceptions as to "effectiveness of present usage" indicated that they believed them to be either "slightly effective" or "moderately effective." Students, contrary to other stratified respondent groups, felt one strategy: "trial plots at provincial level" to be "moderately effective" ($\bar{x} = 3.30$). They assessed the method: "primary and secondary schools informed of IARC's work" to be only "slightly effective" ($\bar{x} = 1.50$). However, the same assessment of only "slightly effective" category was given also to five other strategies. The remaining nine methods were perceived as "moderately effective."

Concerning "anticipated effectiveness when fully implemented," Undergraduate Students anticipated that most of the 15 selected disseminating methods would be "readily effective" ($\bar{x} = 3.81$). Responses constituting anticipated

higher effectiveness were identified the method: "Extension Personnel providing instruction to farmers" and thus assessed as promising to be "readily effective" ($\bar{x} = 4.30$) when fully implemented. Eleven of the methods also were "readily effective." Again, the Undergraduate Students, while much more favorable about their possible future effectiveness than other respondent groups, gave lowest ranking ($\bar{x} = 3.22$) to the method: "primary and secondary schools informed of IARC's work" which fell into the "moderately effective" category. This lowest ranked item was preceded by two other methods: "instruction provided by FAO" and "instruction and demonstrations provided by PVO's" which both of which were assessed as "moderately effective" based on mean scores of 3.30 and 3.40, respectively.

Perceptions by OSU International Graduate Students Studying Agriculture as to the Extent of Present Usage and as to the Present and Future Effectiveness of Dissemination Strategies

Data presented in Table XIV indicate that, when considering " extent of present usage" of the combined 15 strategies, Graduate Students perceived them as "only slightly used" ($\bar{x} = 2.40$). The Graduate Students recognized the method: "textbooks by IARC staff for use in colleges and universities" as "moderately used" ($\bar{x} = 3.35$) and ranked it first in usage among the 15 methods. Seven of the 15

strategies also were perceived as "moderately used." However, the dissemination method: "primary and secondary schools informed of IARC's work" was again ranked lowest, in terms of "not used" ($\bar{x} = 1.40$). The remaining five methods were assessed as only "slightly used."

Responses by Graduate Students regarding assessment of "effectiveness of present usage" showed that they perceived the combined 15 strategies to be "moderately effective" ($\bar{x} = 2.65$). The highest mean response of 3.24 was given to the method: "trial plots at provincial level" which placed it in the "moderately used" category. Ten other strategies also were perceived as "moderately effective" as can be seen in Table XIV. Again, however, the method: "primary and secondary schools informed of IARC's work" with mean score of 1.75 was perceived as the lowest score and, as such, fell into the "slightly effective" category. The remaining three practices also were "slightly effective." Graduate Students, for the most part, judged "present effectiveness" of the 15 strategies as either "slightly effective" or "moderately effective."

When the judgement of "anticipated effectiveness when fully implemented" was considered for the combined 15 selected practices, a mean response of 3.75 was given by the Graduate Students assessing them at the "readily effective" level. Among the 15 methods considered, the highest mean score of 4.40 was given to the method: "trial plots at provincial level" which fell into the "readily effective"

category. Ten of the 15 methods also were "readily effective." However, once again, the lower mean score of 2.91 was given to the method: "primary and secondary schools informed of IARC's work" which placed it in the "moderately effective" category. Three other practices also were perceived as "moderately effective." When considering assessment of "anticipated effectiveness when fully implemented," the Graduate Student group scored each of the 15 selected practices as either "moderately effective" or "readily effective."

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Purpose of Study

The main purpose of this study was to obtain and analyze the perceptions of (a) functioning personnel at the 13 International Agricultural Research Centers (IARC's) and (b) the International Students studying Agriculture at Oklahoma State University (OSU), as to how the Research Centers can best disseminate and utilize information obtainable from IARC's. The study was also designed to identify additional elements of strategy which might enhance or make more effective the dissemination and utilization of research findings from IARC's to farmers and producers.

The following objectives were formulated in order to accomplish the purpose of this study.

1. To review and briefly narrate the experimental work being conducted at each of the Centers which might relate to the nature and extent of dissemination accomplishment and needs.

2. To secure perceptions of functioning personnel serving at each of the 13 International Agricultural Research Centers as to (1) the extent of present usage of each of 15 selected strategies for dissemination of

information obtainable from the Research Centers and (2) the relative effectiveness of strategies now being used to disseminate Center findings, and (3) the anticipated effectiveness if each strategy was fully implemented.

3. To secure the perceptions of International Students studying Agriculture at Oklahoma State University regarding (1) the extent of present usage of each of the 15 selected strategies for dissemination of information obtainable from the Research Centers, (2) the relative effectiveness of strategies now being used to disseminate Center findings, and (3) the anticipated effectiveness if each strategy was fully implemented.

Rationale for the Study

Most commendable is the fact that the 13 International Agricultural Research Centers have now been established in various parts of the world for the purpose of improving the quantity and the quality of production of agricultural products to meet demands of the continually growing population. Still, some needy countries seem to have been unable to make maximum needed utilization of services rendered by these Centers.

Some of the factors that keep the developing countries from receiving maximum benefit from findings of these Research Centers are alleged to be: (a) lack of support by political and administrative leaders, (b) the higher educational institutions of agriculture lacking or not

functioning effectively, (c) lack of continuity of planned programs, (d) lack of knowledge and appreciation of the true value of agricultural research by political and administrative leaders, (e) meager productive relationships between the Experimental Centers, (f) Institutions of Higher Education, and Ministries of Agriculture and/or Agricultural Extension Programs, and (f) lack of long-term, continuous support for research.

Also, to be noted is the absence of graduate training, the lack of effective Extension Services, the inadequate salaries for qualified scientists in the developing nations, and the paucity of up to date equipment and needed supplies. These are some of the reasons often cited as to why developing countries have been unable to utilize findings and information available from the International Research Centers.

Design and Conduct of the Study

After a review of research and literature related to this study, tasks involved in the design and conduct of the study were: (a) selection and development of the questionnaire, (b) validation of the questionnaire, (c) establishment of the study population and administration of the questionnaire, (d) establishment of a procedure for collecting data, and (e) affirming a method for analyzing and describing the collected data.

The population used in this study consisted of 1,550

individuals, including 1,356 persons functionally employed in a total of 13 IARC's, 76 International Undergraduate Students and 118 International Graduate Students studying Agriculture at OSU in the Spring of 1984. The sample size of the total population of IARC's was 295 individuals. This included 65 Trustees, 13 General Directors, 78 Research Scientists, 61 International Cooperation and Outreach Staff, 27 Visiting Scientists and Postdoctoral Fellows, and 51 Communication, Information and Library/Documentation Specialists.

Examination of data received with regard to Center staff clearly revealed that responsibilities and assignments were such as to provide homogeneity. Therefore, for the purposes of the study, they were considered as a single group.

A total of 489 survey instruments were mailed in April, 1984. The questionnaire was designed and validated through a pilot test with International Agricultural and non-Agricultural students at OSU.

To provide for comparative treatments of data, a five point Likert-type scale was used to measure the relative degree of perception by respondents. Numerical values were assigned to the response categories as shown in Table V.

Findings of the Study

Of the 489 survey instruments tended respondents, 135 (27.6%) valid responses were received by the end of

December, 1984. Eighty-six questionnaires (29.2%) were returned from IARC's and 49 (25.3%) from Students.

When reviewing findings, it should be noted that not all statistical computations possible for each of the groups were utilized in this study. Total mean response and rank order were beneficial in summarizing findings for each selected strategy. With regard to major concerns of the study, findings were summarized under each of the fifteen selected strategies or practices.

1. Strategy: "Instruction Provided Through Workshops Held at the Center"

A a group, IARC respondents perceived this strategy to be the most widely used ($\bar{x} = 3.79$) among the selected 15 strategies for dissemination of information. It thus was categorized in the "frequently used" classification, as shown in Table XV. However, International Students at OSU ranked this strategy second ($\bar{x} = 2.76$) which placed it in the "moderately used" category.

With regard to "effectiveness of present usage", IARC staff ranked this strategy highest ($\bar{x} = 3.65$) which placed it in the "readily effective" category. However, students ranked this strategy as fourth ($\bar{x} = 2.76$) which placed it in the "moderately effective" category.

Regarding "anticipated effectiveness if fully implemented", IARC respondents judged this strategy of holding Center workshops as ranking second ($\bar{x} = 4.19$) among the 15 selected strategies which placed it in the "readily

TABLE XV
SUMMARY OF PERCEPTIONS AS TO USAGE AND EFFECTIVENESS OF
SELECTED STRATEGIES

Strategy No.	Strategy or Practice	Extent of Present Usage						Effectiveness of Present Usage						Anticipated Effectiveness If Fully Implemented					
		IARC's			Students			IARC's			Students			IARC's			Students		
		M ¹	V	R	M	V	R	M	V	R	M	V	R	M	V	R	M	V	R
2.	Workshops at the Centers	3.79	FQ	1	2.76	MU	2	3.65	RE	1	2.76	ME	4	4.19	RE	2	4.00	RE	4
3.	Internships at the Centers	3.51	FQ	2	2.53	MU	7	3.56	RE	2	2.73	ME	7	4.01	RE	7	4.02	RE	3
9.	Specialists to provide presentations and demonstrations	3.32	MU	3	2.62	MU	4	3.18	ME	5	2.67	ME	8	4.16	RE	3	3.47	ME	13
12.	Informing research personnel other than IARC's	3.13	MU	4	2.59	MU	6	3.49	ME	3	3.09	ME	2	4.23	RE	1	4.00	RE	4
15.	Trial plots at provincial level	2.97	MU	5	2.79	MU	1	3.28	ME	4	3.26	ME	1	4.13	RE	4	4.30	RE	1
14.	Joint conferences and planning sessions	2.79	MU	6	2.43	SU	9	2.86	ME	9	2.74	ME	6	3.73	RE	10	3.92	RE	7
11.	Extension personnel providing instruction to farmers	2.72	MU	7	2.36	SU	11	3.03	ME	8	2.87	ME	3	4.11	RE	5	4.23	RE	2
10.	Textbooks by IARC staff for use in universities	2.67	MU	8	2.43	SU	9	3.06	ME	6	2.65	ME	9	3.95	RE	8	3.96	RE	6
6.	Informing government officials about IARC's	2.45	SU	9	2.73	MU	3	3.04	ME	7	2.62	ME	10	3.79	RE	9	3.60	RE	11
8.	Dispersion of research needs in developing nations	2.41	SU	10	2.24	SU	13	2.58	ME	11	2.49	SE	11	3.32	ME	13	3.66	RE	10
1.	Course work at universities	2.40	SU	11	2.47	SU	8	2.49	SE	12	2.38	SE	12	3.33	ME	12	3.55	RE	12
4.	Instruction provided by FAO and UNDP	2.17	SU	12	2.62	MU	4	2.61	ME	10	2.75	ME	5	4.08	RE	6	3.67	RE	9
5.	Demonstrations provided by PVO's	1.85	SU	13	2.26	SU	12	2.37	SE	13	2.13	SE	14	3.19	ME	14	3.11	ME	14
13.	Adult villagers in training at IARC's	1.80	SU	14	2.06	SU	14	2.15	SE	14	2.38	SE	12	3.48	ME	11	3.88	RE	8
7.	Primary and secondary schools informed of IARC's work	1.61	SU	15	1.45	NU	15	1.63	SE	15	1.70	SE	15	2.94	ME	15	2.98	ME	15
Total (N = 489)		2.71	MU		2.44	SU		2.91	ME		2.62	ME		3.76	RE		3.76	RE	

¹ M=Mean. V=Value categories as interpreted in Table V. R=Rank.

effective" category. Students also perceived it to be in the "readily effective" category ranking fourth ($\bar{x} = 4.00$).

2. Strategy: "Instruction and Experience Provided by Internships at the Center"

In terms of "extent of present usage", IARC respondents judged this method to be in the "frequently used" category. This method was ranked second ($\bar{x} = 3.51$) among the 15 selected strategies. On the other hand, students judged it to be in the "moderately used" category which placed it seventh ($\bar{x} = 2.53$) among the selected strategies in terms of "extent of present usage".

With regard to "effectiveness of present usage", the method was ranked second ($\bar{x} = 3.56$) by Center staff which placed it in the "readily effective" category. However, students perceived the practice as "moderately effective" which ranked it seventh ($\bar{x} = 2.73$).

Regarding "anticipated effectiveness if fully implemented", IARC staff thought the practice to be "readily effective" thereby ranking the method seventh ($\bar{x} = 4.01$). Students at OSU also agreed that the practice would be "readily effective" when fully implemented. Students ranked it third ($\bar{x} = 4.02$).

3. Strategy: "Knowledgeable and Competent Specialists Employed to Produce Media Presentations and Demonstrations"

Perceptions of IARC staff regarding "extent of present usage" revealed that they recognized this strategy as

"moderately used." Among the strategies proffered, the staff ranked it third ($\bar{x} = 3.32$). Students also agreed, placing it at the "moderately used" level and ranking it fourth ($\bar{x} = 2.62$).

In terms of "effectiveness of present usage", IARC staff perceived the method to be "moderately effective" thus ranking the practice fifth ($\bar{x} = 3.18$). Students also judged the method to be at the "moderately effective" level, but ranked it eighth ($\bar{x} = 2.67$).

In terms of "anticipated effectiveness if fully implemented", IARC respondents ranked the method third ($\bar{x} = 4.16$) and placed it as "readily effective." Nevertheless, students perceived the method as being in the "moderately effective" category and ranked it thirteenth ($\bar{x} = 3.47$).

4. Strategy: "Personnel Serving in Experiment Stations Other Than IARC's Become Knowledgeable about work performed at the Center and Attempt Closer Coordination of Experimental Work Throughout the Nation and/or Area"

In terms of "extent of present usage", IARC staff judged this method as "moderately used" giving it a fourth place ranking ($\bar{x} = 3.13$). Students also judged it as the "moderately used" level with a sixth place ranking ($\bar{x} = 2.59$).

With regard to "effectiveness of present usage", IARC staff perceived this practice to be "moderately effective" and ranked it third ($\bar{x} = 3.49$). OSU students also perceived it to be "moderately effective" and ranked it second ($\bar{x} =$

3.09).

In terms of "anticipated effectiveness if fully implemented", IARC respondents highlighted the strategy by ranking it first ($\bar{x} = 4.23$), thus placing it at the "readily effective" level. Students also anticipated that when fully used, the practice would be "readily effective". Contrasting with IARC personnel ranking, student's "anticipations of future effectiveness" placed the strategy in a fourth position ranking ($\bar{x} = 4.00$).

5. Strategy: "Through the Ministry of Agriculture and/or Agricultural Extension, a Network of 'Trial Plots' at the Provincial or Village Level to Promote Farmers Understanding and Adoption."

In terms of "extent of present usage", IARC staff assessed this strategy to be in the "moderately used" category giving it a fifth place ranking ($\bar{x} = 2.91$). Nevertheless, in the perception of the students, the present usage of the strategy was ranked first ($\bar{x} = 2.79$) which placed it at the "moderately used" level.

With regard to "effectiveness of present usage", the strategy was ranked fourth ($\bar{x} = 3.28$) by staff and was felt to be "moderately effective." Students also judged the strategy as "moderately effective"; however, students responded by ranking the method first ($\bar{x} = 3.26$) among the 15 selected strategies.

Regarding "anticipated effectiveness when fully implemented", IARC staff anticipated the strategy to be at

the "readily effective" level, ranking it fourth ($\bar{x} = 4.13$). Students highlighted the practice ranking it first among all selected strategies ($\bar{x} = 4.30$). They placed it at the "readily effective" level.

6. Strategy: "Through Joint Conferences and Planning Sessions Including Center Personnel, Agricultural Extension Staff and University Professors, a Program for Dissemination of Center Findings be Developed"

Concerning "extent of present usage", the IARC staff categorized this practice as "moderately used" and ranked it sixth ($\bar{x} = 2.79$). However, students perceived it to be "only slightly used," ranking it ninth ($\bar{x} = 2.43$).

IARC staff, relating to "effectiveness of present usage", categorized the practice as "moderately effective," ranking it ninth ($\bar{x} = 2.86$). Similarly, the method was placed in the "moderately effective" category, and thus was ranked sixth ($\bar{x} = 2.74$) by students.

In terms of "anticipated effectiveness if fully implemented", IARC respondents perceived that the method would be "readily effective," ranking it tenth ($\bar{x} = 3.73$). Similarly, students also viewed it as "readily effective" ranking it seventh ($\bar{x} = 3.92$).

7. Strategy: "Agricultural Extension Personnel, Especially Specialists, Provide Instruction about IARC Findings to Farmers and/or Producers"

IARC staff when responding as to "extent of present usage", assessed this strategy as "moderately used" giving

it a seventh place ranking ($\bar{x} = 2.72$). However, OSU students believed this strategy was "only slightly used" and ranked it in eleventh place ($\bar{x} = 2.36$).

With regard to "effectiveness of present usage", IARC staff noted that the strategy was "moderately effective" and ranked it eighth ($\bar{x} = 3.03$). Students also judged "effectiveness of present usage" to be "moderately effective" with a third place ranking ($\bar{x} = 2.87$).

Regarding "anticipated effectiveness if fully implemented", IARC respondents regarded the method as "readily effective" and ranked it fifth ($\bar{x} = 4.11$). Students also judged that it would be "readily effective" giving it the high ranking of second place ($\bar{x} = 4.23$).

8. Strategy: "Textbooks and Instructional Materials

Developed by Staff in Each of the IARC's to be Used in Institutes, Colleges, and Universities"

Regarding "extent of present usage", this practice was recognized by IARC staff as "moderately used" and ranked eighth ($\bar{x} = 2.67$). On the other hand, students perceived it as belonging in the "only slightly used" category and ranked it ninth ($\bar{x} = 2.43$).

In terms of "effectiveness of present usage", IARC staff viewed the method as being "moderately effective" and ranked it sixth ($\bar{x} = 3.06$). Similarly, students responded in placing the practice in the "moderately effective" category and ranked it ninth ($\bar{x} = 2.65$).

Concerning "anticipated effectiveness when fully

implemented", IARC staff placed the practice at the "readily effective" level which ranked it eighth ($\bar{x} = 3.95$). Students also classified it at the "readily effective" level which ranked it sixth ($\bar{x} = 3.96$).

9. Strategy: "Government Officials in Developing Countries Assisted to Become Fully Informed about Nature and Effectiveness of the IARC's"

Relating to "extent of present usage", IARC staff indicated that this strategy was the "only slightly used," ranking it ninth ($\bar{x} = 2.45$). Conversely, students thought the strategy to be in the "moderately used" category, ranking third ($\bar{x} = 2.73$).

Concerning "effectiveness of present usage", the method was placed in the "moderately effective" category and ranked seventh ($\bar{x} = 3.04$) by Center staff. Students also judged it as belonging in the "moderately effective" category, ranking it tenth ($\bar{x} = 2.62$).

When IARC staff gave their perceptions regarding "anticipated effectiveness if fully implemented", they said it would be "readily effective," and ranked it ninth ($\bar{x} = 3.79$). In agreeing closely, the method was placed at the "readily effective" level and ranked eleventh ($\bar{x} = 3.60$) by students.

10. Strategy: "In Developed Countries Dispersion of Information about Needs for Research and Education in Developing Countries"

With regard to "extent of present usage", this practice

was judged as belonging in the "only slightly used" category and was ranked tenth ($\bar{x} = 2.41$) by IARC staff. Students likewise perceived it as being "only slightly used" ranked it thirteenth ($\bar{x} = 2.24$).

In terms of "effectiveness of present usage", IARC staff judged the practice to be in the "moderately effective" category and ranked it eleventh ($\bar{x} = 2.58$). Nevertheless, students perceived it as belonging only in the "slightly effective" category and also ranked it eleventh ($\bar{x} = 2.49$).

Regarding "anticipated effectiveness if fully implemented", the strategy was placed in the "moderately effective" category and ranked thirteenth ($\bar{x} = 3.33$) by IARC staff. However, students anticipated it as belonging at the "readily effective" level and ranked it tenth ($\bar{x} = 3.66$).

11. Strategy: "Instruction Provided through Course Work at Universities and Colleges"

Relating to "extent of present usage", both IARC staff and students judged the method as "only slightly used," ranking it eleventh ($\bar{x} = 2.40$) and eighth ($\bar{x} = 2.47$), respectively.

Concerning "effectiveness of present usage", both IARC staff and students considered the method as only "slightly effective." Both groups ranked the method twelfth with means of 2.49 and 2.38, respectively.

Regarding "anticipated effectiveness if fully implemented", this strategy was placed in the "moderately

effective" category by IARC respondents and in the "readily effective" category by students. Both groups ranked the strategy twelfth with mean scores of 3.33 and 3.55, respectively.

12. Strategy: "Instruction Provided Through FAO and UNDP"

With regard to "extent of present usage", IARC staff perceived this practice to be "only slightly used" and ranked it twelfth ($\bar{x} = 2.17$). However, OSU students felt it to be "moderately used" and ranked it fourth ($\bar{x} = 2.62$).

In terms of "effectiveness of present usage", the strategy was viewed as "moderately effective" by both groups. Rankings were tenth ($\bar{x} = 2.61$) and fifth ($\bar{x} = 2.75$) by Center staff and students at OSU, respectively.

Regarding "anticipated effectiveness when fully implemented", both groups judged the practice belonging in the "readily effective" category, ranking it sixth ($\bar{x} = 4.08$) and ninth ($\bar{x} = 3.67$) places, respectively.

13. Strategy: "Instruction and Demonstration Provided Through Work by Private Voluntary Organizations (PVO's)"

In terms of "extent of present usage", this method was placed in the "only slightly used" category by both groups and rated thirteenth ($\bar{x} = 1.85$) by Center staff and twelfth ($\bar{x} = 2.26$) by students, respectively.

When considering "effectiveness of present usage", both groups perceived the method as only "slightly effective," staff ranking it thirteenth ($\bar{x} = 2.37$), and students ranking

it fourteenth ($\bar{x} = 2.13$).

Concerning "anticipated effectiveness when fully implemented", the method was placed in the "moderately effective" category by both groups. Both groups also ranked the practice fourteenth among the 15 selected strategies. The mean response was 3.19 by staff and 3.11 by students, respectively.

14. Strategy: "Villagers in Developing Countries Select and Sponser Adult Members of the Village to Participate in Extensive Training Sessions Provided by the IARC's"

In regard to "extent of present usage", both IARC staff and students perceived this strategy as "only slightly used." Likewise, both groups gave the strategy a ranking of fourteenth among the 15 selected strategies. The mean response was 1.80 by staff and 2.06 by students, respectively.

With regard to "effectiveness of present usage", both the Center staff and International students at OSU agreed that the strategy was only "slightly effective." Center staff ranked it fourteenth ($\bar{x} = 2.15$) while students ranked it twelfth ($\bar{x} = 2.38$).

In terms of "anticipated effectiveness when fully implemented", IARC staff anticipated the strategy to be in the "moderately effective" category and ranked it eleventh ($\bar{x} = 3.48$). However, students judged it to be in the "readily effective" level and ranked it eighth ($\bar{x} = 3.88$).

15. Strategy: "In Developing Countries,
the Work of IARC's Widely
Taught in Primary and
Secondary Schools"

Regarding "extent of present usage", IARC staff judged the strategy to be in the "only slightly used" category, ranking it last in fifteenth place ($\bar{x} = 1.61$). On the other hand, students judged the practice to be "not used" and also ranked it the lowest at fifteenth ($\bar{x} = 1.45$).

Concerning "effectiveness of present usage", both groups perceived the practice as only "slightly effective." The lowest mean scores occurring among the 15 strategies was showed for the practice, ranking it as 1.63 by IARC staff and 1.70 by students.

Finally, regarding "anticipated effectiveness when fully implemented", both groups anticipated the strategy as belonging in the "moderately effective" category. Both mean scores, 2.94 by the staff and 2.98 by the students, were recognized as the lowest responses for this strategy among the 15 selected strategies.

Conclusions of the Study

Interpretation of the findings of this study prompted the following conclusions:

1. It can be readily concluded that Center personnel perceived strategies largely in terms of those surroundings with which they were most familiar. They indicated such

strategies being used most frequently at present to be "workshops at the Centers."

2. It can likewise be concluded that perceptions of International Students were largely dependent upon their study at OSU. They perceived strategies presently being most often used were "trial plots at provincial level" and "workshops at the Centers."

3. In like manner, it can be concluded that IARC respondents were also prone to consider strategies promising for future use to be more closely related to their Centers but also were mindful of the value of sharing with other Experiment Stations. They listed as most promising the two strategies: "workshops at the Centers" and "informing research personnel other than IARC's."

4. In like manner, it can be concluded that perceptions of International students reflecting their assessment of future promise for dissemination strategies were evidently most dependent upon their studies at OSU. They listed as most promising the two strategies: "trial plots at provincial level" and "Extension personnel providing instruction to farmers."

5. It can be concluded that those three strategies which were ranked relatively low in terms of present usage by both IARC staff and OSU students: (1) "primary and secondary schools informed of IARC's work," (2) "adult villagers in training at IARC's," and (3) "demonstrations provided by PVO's," also were those which were ranked

relatively lower in terms of anticipated future effectiveness.

6. It must be concluded that IARC personnel had positive and expectant attitudes when assessing the anticipated effectiveness of strategies as such methods become more fully implemented. Such perceptions were evidenced by the fact that respondents rated ten of 15 strategies as being "readily effective" when fully implemented.

7. The conclusion is inescapable that while IARC personnel recognize that the strategy of "informing government officials about the nature, scope and effectiveness of the Center's work" is presently only "slightly used," they are evidently quite aware of the potential value of this strategy. This was evident in an expressed anticipation that the strategy would be "readily effective" when it was fully implemented.

8. It is concluded that International Students at OSU seem to be rather lacking in knowledge about IARC's. A sizeable number of students did not complete the questionnaire while others only signed their names, with a written comment that "I have never heard of IARC's" or "I know little or nothing about them."

9. It is further concluded that IARC respondents tend to perceive anticipated future effectiveness as being closely related to their own work, specifically that which is carried out at the Center. They tend to believe that

strategies involving schools and other agencies are, at present, relatively ineffective. However, they acknowledged that such strategies might well be effective when fully implemented.

Recommendations with Implications for Agricultural Education

1. Research on basic food crops at the IARC's is extremely important for the present and future well being of the developing countries provided suitable mechanisms can be found to transfer and apply the technologies of communication and dissemination.

2. Extra effort should be made by all concerned, including the IARC and developing country personnel, to disseminate the research information more widely to farmers.

3. Additional effort should be made to inform all International Students, government officials, and the public about the work of the IARC's since tremendous food deficits seem to continue in developing countries.

4. It is important that the IARC's cooperate more fully with all agencies involved in the dissemination of Center research findings.

5. Land Grant Universities should collaborate more fully with the IARC's through Title XII and other mechanisms.

6. Furthermore, it is strongly recommended that: (1) the instructional segment in agriculture at colleges and

universities include studies as to the nature and scope of world-wide agricultural production, research and the educational functions of development, (2) agricultural educators should make every effort to communicate more fully with personnel of the IARC's, and (3) educators should take the initiative by offering to jointly plan workshops in dissemination methods, to conduct research in dissemination and particularly to work with supporting agencies to plan projects which will involve "change-agent" institutions in the dissemination of IARC findings.

7. Finally, the developing nations retain major responsibilities for agricultural development, and they must train at least a minimal scientific staff which can maintain contact with the IARC's and transfer proven new technologies, varieties, and farming systems from the Centers to their own farmers.

SELECTED REFERENCES

- Agricultural Assistance Sources. IADS (International Agricultural Development Service), Arlington, VA, USA. 1980.
- Bengtsson, Bo. International Agricultural Research (CGIAR). SAREC: Swedish Agency for Research Cooperations with Developing countries, 1981/1982, p. 37-39.
- Bengtsson, Bo. International Agricultural Research: Consultative Group on International Agricultural Research (CGIAR). SAREC: Swedish Agency for Research Cooperations with Developing Countries, 1981/1982, p. 41-43.
- Benor, D. T. & V. Putting Intentions into Practice. Interpaks Interchange March, 1984, V. 1(2):1. University of Illinois, Urbana-Champaign, Illinois, USA.
- Byrnes, F. C. Communication Essential Element at International Center. ACE Q. 63(2):23-31. 1980
- CIMMYT 1982 Annual Report. International Maize and Wheat Improvement Center, Mexico, D. F., Mexico. 1983
- Claxton, B. H. Teaching with Transparencies. Agricultural Education Magazine V. 44(3):62 (Sept. 1971).
- Consultative Group on International Agricultural Research. Published by CGIAR Secretariat, Washington D. C. USA. 1980.
- Consultative Group on International Agricultural Research. Published by CGIAR Secretariat, Washington D. C. USA. 1983.
- Gowder, S., H. A. Ables, and T. R. Hargrove. Training Needs Information Services in Agricultural Research and Educational Organization in Asia: A 9-Country Survey. IRRI Research Paper Series No. 98. International Agricultural Research Institute, Manila, Philippines. No. 1983.

- Haws, L. D. Strategies for Information Dissemination from Research to Producer. In Rice Research Strategies for the Future International Rice Research Institute, Los Banos, Philippines. 1982.
- Hargrove, T. R. and V. T. John, Scientific Publication: Trends and Needs in Rice Improvement. In Rice Research Strategies for the Future by International Rice Research Institute, Los Banos, Philippines. 1982.
- IBPGAR Annual Report 1980. International Board for Plant Genetic Resources, Plant Production & Protection Division, FAO of the UN, Rome, Italy.
- ICRISAT Challenge and Research. International Crops Research Institute for the Semi-Arid Tropics, Andhra Pradesh, India. 1983.
- IFPRI Report 1982. International Food Policy Research Institute, Washington, D. C. 1983.
- ILCA Annual Report 1982. International Livestock Centre for Africa, Addis Ababa, Ethiopia. 1982
- Kharub, R. K. and R. P. Singh. A Study to Assess the Effectiveness of Radio in Disseminating Agricultural Information in Haryana. GAU Res. J. Vol. 15 No. 2 (1980) pp. 31-34.
- Kriesberg, Martin. International Organizations and Agricultural Development: II. International Agricultural Research Center. Office for International Cooperation & Development and International Organization Affairs, USDA, Washington, D. C., 1981.
- Madamba, J. C. Strengthening National Agricultural Research: The Role of International Associations. Paper Prepared at a workshop in Bellazio, Italy. 1981.
- Matebesi, M. Around the World: Agricultural Information in Botswana. INTERPAKS INTERCHANGE March, 1984, Vol. 1(2):7. University of Illinois, Urbana-Champaign, Illinois, U. S. A.
- News form CGIAR. V. 3(4):1, Dec. 1983. Published by CGIAR Secretariat, Washington, D. C. U. S. A.
- Olgren, C. H. and Parker, L. A. Introduction: Teleconferencing as a Communications Tool. In Teleconferencing Technology and Applications. Airtech House Inc., Dedham, MA, U. S. A. 1983.
- Omdal, S. Videotape. An Effective Teaching Device. Agricultural Education Magazine. v. 42(4):81, Oct. 1970.

- Patterson, G. D. Teaching Skills with Video Tapes. Agricultural Education Magazine, v. 53(10):20. April, 1981.
- Plucknett, D. L. and Smith, N. J. Networking in International Agricultural Research. Science. v. 225:989-993. 7 September, 1984.
- Price, R. R. The Promise of Increased Production Through Sustained Agricultural Research Problems. AGED 4713: Foods Future: The Alleviation of World Hunger, Independent and Correspondence Study, Oklahoma State University, Stillwater, Oklahoma, U. S. A. 1984.
- Publications on International Research and Development. Published by GTZ, CGIAR, and IRRI, 1983.
- Read, H. Education in Rural Journalism Needed Overseas. ACE O. 63(4):38. 1980.
- Sattar, A. and Lancaster, F. W. The Role of the Information Specialist in the Dissemination of Agricultural Information. INTERPAKS Series No. 2. Office of International Agriculture, University of Illinois, Urbana-Champaign, Illinois, U. S. A., March, 1984.
- The Fragile Web: The International Agricultural Research System. International Development Research Center, Ottawa, Canada. 1983.
- WARDA Research Development: 1980 Annual Report. West Africa Rice Development Association, Monrovia, Liberia, 1980
- Wclff, Anthony. The Consultative Group. The Rockefeller Foundation. Vol. 5(2):6. May, 1981.
- Wortman, S. and R. W. Cummings. The World Assistance Community Mobilizes. In To Feed This World: The Challenge and the Strategy. The Johns Hopkins University Press, Baltimore, U. S. A. 1978.

APPENDIXES

APPENDIX A

COVER LETTERS AND QUESTIONNAIRES

**OKLAHOMA STATE UNIVERSITY • STILLWATER**

Department of Agricultural Education
448 Agricultural Hall
624-5129

74078

April 16, 1984

TO: International Students Studying Agriculture at
Oklahoma State University

FROM: Young Joo Kim of Korea, Graduate Student in
Agricultural Education and Robert R. Price, Professor
Emeritus

We sincerely request your assistance for about 25 minutes!

We are attempting to determine what agricultural students at Oklahoma State University **know** and what **opinions** they have about a very important aspect of **development** in their own and other countries. The results of this study will be of help both to professors here at OSU and to those who administer and work in research in **developing** countries of the world.

Please read the instructions, fill out, and return the questionnaire as quickly as you find it convenient.

Thank you very much.

Young Joo Kim
Young Joo Kim

Robert R. Price
Robert R. Price



OKLAHOMA STATE UNIVERSITY • STILLWATER

Department of Agricultural Education
448 Agricultural Hall
624-5129

74078

April 23, 1984

TO: Board of Trustees of International Agricultural Research Centers, Worldwide

FROM: Young Joo Kim, Graduate Assistant, Robert R. Price, Professor Emeritus, Oklahoma State University and U.J. Grant former Director General, CIAT, and presently Adjunct Professor of Agronomy and International Programs officer, Oklahoma State University.

We sincerely request your assistance in helping with a project directed toward securing information which might be useful in possible improvement of current practices and strategies of dissemination of Center research findings. The project, "Strategies for Effective Dissemination of Research Findings from International Agricultural Research Centers as perceived by Center Staff and by International Students enrolled at the University," is carried out both as a Departmental study and dissertation topic for a doctoral aspirant.

Although this questionnaire schedule has been distributed to representative staff at all thirteen International Agricultural Research Centers, we also recognized the very important function rendered by Trustees.

At your convenience, please review the schedule and return with any comments or suggestions you might wish to make.

We feel that this request is most important because it is almost mandatory that developing countries accelerate their use of Center Research information. Your prompt response to this request will enable us to proceed with the study and hopefully provide meritorious recommendations.

Thank you very much.

Young Joo Kim
Young Joo Kim

Robert R. Price
Robert R. Price

U.J. Grant
U.J. Grant

**OKLAHOMA STATE UNIVERSITY • STILLWATER**

Department of Agricultural Education
448 Agricultural Hall
624-5129

74078

April 12, 1984

TO: Directors and Administrators of International Agricultural
Research Centers, Worldwide

FROM: Young Joo Kim, Graduate Assistant, Robert R. Price, Professor
Emeritus, Oklahoma State University and U.J. Grant former
Director General, CIAT, and presently Adjunct Professor of
Agronomy and International Program Officer, Oklahoma State
University.

We sincerely request your assistance in distributing the data
gathering schedule to the persons whose names appear on the envelopes
enclosed. If the individual is no longer employed by the center,
please give it to the person now occupying this position.

Please update the listing of members of the Board of Trustees
giving names and addresses of any replacements. The latest information
we have is from the last annual reports.

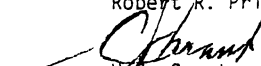
Finally, please complete and return the questionnaire form
including any additional suggestions you may have.

Please return as quickly as you find it convenient.

Thank you very much.


Young Joo Kim


Robert R. Price


U.J. Grant



OKLAHOMA STATE UNIVERSITY • STILLWATER

Department of Agricultural Education
448 Agricultural Hall
624-5129

74078

April 23, 1984

TO: Center Staffs, International Agricultural Research Centers, Worldwide

FROM: Young Joo Kim, Graduate Assistant, Robert R. Price, Professor Emeritus, Oklahoma State University and U.J. Grant former Director General, CIAT, and presently Adjunct Professor of Agronomy and International Programs Officer, Oklahoma State University.

We sincerely request your assistance in helping with a project directed toward securing information which might be useful in possible improvement of current practices and strategies of dissemination of Center research findings. The project, "Strategies for Effective Dissemination of Research Findings from International Agricultural Research Centers as perceived by Center Staff and by International Students enrolled at the University," is carried out both as a Departmental study and a dissertation topic for a doctoral aspirant.

This questionnaire is being distributed to Center Staff and Board of Trustees of all thirteen International Research Centers because we recognize the very important functions carried out by each of the Center directors, board of trustees, research scientists and other staff.

At your convenience, please review the schedule and return with any comments or suggestions you might wish to make.

We feel that this request is most important because it is almost mandatory that developing countries accelerate their use of Center Research information. Your prompt response to this request will enable us to proceed with the study and hopefully provide meritorious recommendations.

Thank you very much.

Young Joo Kim
Young Joo Kim

Robert R. Price
Robert R. Price

U.J. Grant
U.J. Grant

RESPONSE SCHEDULE

Name (Optional): _____

Institute Identification:	Position Held (Please check):
1. CIAT _____	1. Member Board of Trustees _____
2. CIP _____	2. General Director _____
3. CIMMYT _____	3. Research Scientist _____
4. IBPGR _____	4. Member of International Cooperation and Outreach _____
5. ICARDA _____	5. Visiting Scientist and Postdoctoral Fellow _____
6. ICRISAT _____	6. Officer of Communication, Information, and Library/ Documentation _____
7. IFPRI _____	
8. IITA _____	
9. ILCA _____	
10. ILRAD _____	
11. IIRI _____	
12. ISNAR _____	
13. WARDA _____	

Number of years associated with program _____

Citizenship (identify nation) _____

Major area of interest _____

Experience in the area of dissemination of research information
(Extension, University, etc.)

As you are well aware, many findings of the International Agriculture Research Centers can be most helpful to people in developing countries. However, they must be understood and put into practice by the farmers and producers. The purpose of this study is to secure judgments as to how this information can best be disseminated effectively to the users.

Reports are that some dissemination strategies/methods/avenues are used to a much greater extent than are others. The extent of usage may vary among the different centers. It should also be recognized that many times a combination of several strategies may be most effective.

The following questionnaire contains statements concerning the dissemination of information available from the IARCs to the developing countries and/or interested individuals.

Your help through responses to statements in this questionnaire will be greatly appreciated. The findings from this study will hopefully be useful in formulating recommendations for improving the effectiveness of the dissemination function.

RESPONSE SCHEDULE

Name (optional) _____ Classification (circle years)
 Citizenship (country) _____ Undergraduate: 1 2 3 4
 Major field of study _____ Graduate: Master Doctoral
 Other U.S. institutions attended _____

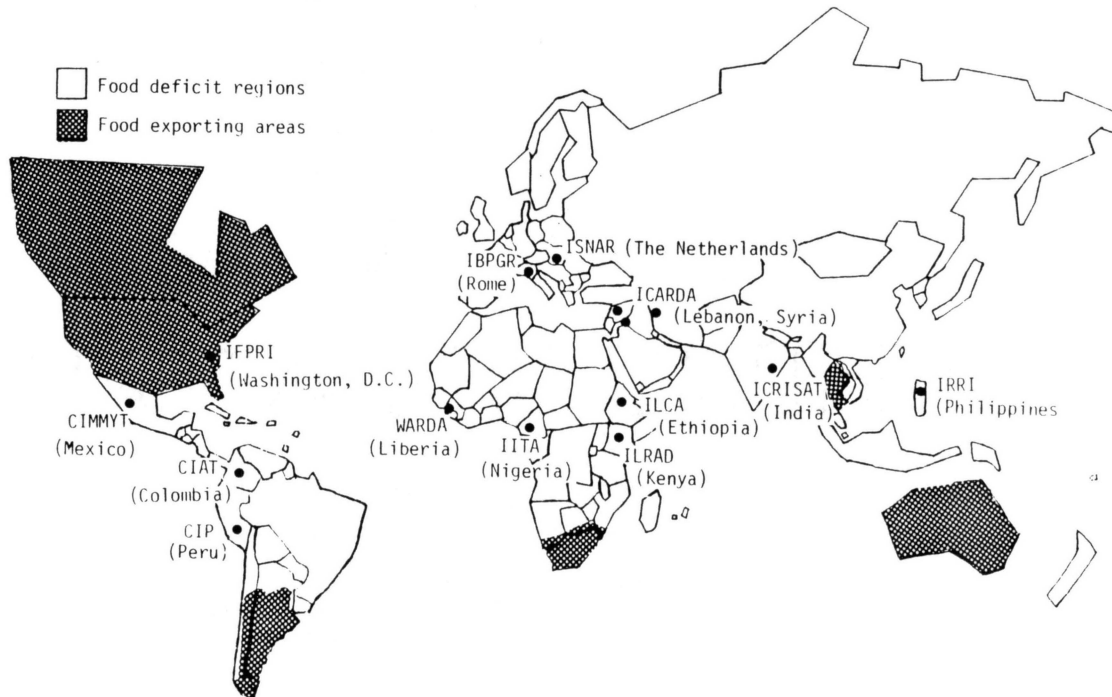
What position did you hold prior to coming to the United States?

Presently do you know of work being accomplished by the International Agricultural Research Centers (IARCs)? (Check one)

- _____ Yes, I know fully.
 _____ Yes, only very little.
 _____ Yes, I am somewhat knowledgeable.
 _____ No, I am not knowledgeable.

After you have checked your answer to the above, please read the following brief summary of the IARCs.

The International Agricultural Research Centers (IARCs) are located in different parts of the world and especially in the developing countries. Their main objective is to increase and improve the quantity and the quality of agricultural food production in the developing countries by use of new technologies and recommended practices.

International Agricultural Research Centers' Names and Locations

CIAT: Centro Internacional de Agricultura Tropical. Cali, Colombia
 CIMMYT: Centro Internacional de Mejoramiento de Maiz y Trigo. El Batán, Mexico
 CIP: Centro Internacional de la Papa. Lima, Peru
 IBPGR: International Board for Plant Genetic Resources. Rome, Italy

ICARDA: International Center for Agricultural Research in the Dry Areas. Aleppo, Syria
ICRISAT: International Crops Research Institute for the Semi-Arid Tropics. Hyderabad, India
IFPRI: International Food Policy Research Institute. Washington, D.C., United States
IITA: International Institute of Tropical Agriculture. Ibadan, Nigeria
ILCA: International Livestock Center for Africa. Addis Ababa, Ethiopia
ILRAD: International Laboratory for Research on Animal Diseases. Nairobi, Kenya
IRRI: International Rice Research Institute. Los Banon, Phillippines
ISNAR: International Service for National Agricultural Research, The Hague, Netherlands
WARDA: West Africa Rice Development Association. Monrovia, Liberia

As you are well aware, many findings of the International Agriculture Research Centers can be most helpful to people in developing countries. However, they must be understood and put into practice by the farmers and producers. The purpose of this study is to secure judgments as to how this information can best be disseminated effectively to the users.

Reports are that some dissemination strategies/methods/avenues are used to a much greater extent than are others. The extent of usage may vary among different centers. It should also be recognized that many times a combination of several strategies may be most effective.

The following questionnaire contains statements concerning the dissemination of information available from the IARCs to the developing countries and/or interested individuals.

Your help through responses to statements in this questionnaire will be greatly appreciated. The findings from this study will hopefully be useful in formulating recommendations for improving the effectiveness of the dissemination function.

QUESTIONNAIRE

INSTRUCTIONS: Please respond in each of the column groupings (I, II and III), placing a check (or X) indicating your judgement as to (1) extent of present usage (2) effectiveness of present usage, and (3) the degree of effectiveness you would anticipate if this strategy and/or method was greatly utilized in the future to disseminate research information from IARC's.

I					II					III					
Extent of Usage At Present					Judgement as to Present Effectiveness					Judgement as to Anticipated Effectiveness If Fully Implemented					
Not Used	Only Slightly Used	Moderately Used	Frequently Used	Fully Used	Not Effective	Slightly Effective	Moderately Effective	Readily Effective	Highly Effective	Not Effective	Slightly Effective	Moderately Effective	Readily Effective	Highly Effective	
1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
Dissemination Strategies, Methods, and/or Avenues for Getting Information from Center to Farmers and/or Food Producers															
					1. Instruction provided through course work at Universities or Colleges.										
					2. Instruction provided through workshops held at the Center.										
					3. Instruction and Experience provided by an internship at the Center.										
					4. Instruction provided through Food and Agriculture Organization of the United Nations (FAO) and the United Nations Development Programme (UNDP).										

					<p>13. Villagers in <u>DEVELOPING</u> countries select and sponsor adult members of the villages to participate in extensive training sessions provided by the IARC's. Such programs are structured according to the concept of a <u>FOOD CORPS</u> or <u>SARVODAYA</u> movement.</p>													
					<p>14. Through joint conferences and planning sessions including: (1) Center personnel, (2) Agricultural Extension staff, and (3) University professors, a program for dissemination of Center findings is developed.</p>													
					<p>15. Through the Ministry of Agriculture and/or Agricultural Extension, a network of "trial plots" at the provincial or village level to enhance village farmer understanding and adoption.</p>													

16. Please give your comments or suggestions on how the dissemination of information from the IARC to the developing countries and interested individuals could be improved. When commenting regarding any specific dissemination strategy, please refer to the number by which it is listed. (Please continue comments on reverse side.)

APPENDIX B

SUPPORTING INFORMATION

January 24, 1984

International
Agricultural Research Centers

Gentlemen:

I am a Doctoral candidate in the department of Agricultural Education at Oklahoma State University in the United States. I am a citizen of South Korea and I plan to return to my country to teach at the college or university level.


My dissertation will be related to "Strategies for Effective Dissemination of Research Findings from International Agricultural Research Centers as perceived by Center Staff and International Students." I am concerned that although this valuable research is being done, much of it is not being utilized for a number of reasons. Perhaps my dissertation will serve to determine the reasons why this is so.

If your center has available center publications which would help me to get started on this subject, I would most appreciate having a copy, particularly which describe your center programs. I also would most appreciate a copy of the latest annual reports and a list of publications. I will be pleased to send you the price of purchase if there is a charge.

I feel that this request is most important because developing countries need to accelerate their use of center research information. Your prompt response to this request will help me very much since I am now beginning my literature review.

Request approved:

Sincerely yours,


Robert R. Price
Research Advisor


Young Joo Kim

PS: In a few months when my research program has progressed sufficiently, I'll plan to request members of your center staff to respond a brief questionnaire schedule.

January 24, 1984

Secretariat
Consultative Group on International
Agricultural Research
1818 W. Street N.W.
Washington, D.C. 20433

Gentlemen:

I am a Doctoral candidate in the department of Agricultural Education at Oklahoma State University. I am a citizen of South Korea and I plan to return to my country to teach at the college or university level.

My dissertation will be related to "Strategies for Effective Dissemination of Research Findings from International Agricultural Research Centers as perceived by Center Staff and International Students." I am concerned that although this valuable research is being done, much of it is not being utilized for a number of reasons. Perhaps my dissertation will serve to determine the reasons why this is so.

If the CGIAR has available center publications which would help me to get started on this subject, I would most appreciate having a copy, particularly which describes the center programs. I also would most appreciate a copy of the latest annual reports from the centers. If you do not have these publications, would you please send me the addresses where I can order them. I will be pleased to send you the price of purchase if there is a charge.

In addition, could you please send me a list of publications from each center. I have checked the library and I have not found a complete set of the above.

I feel that this request is most important because the developing countries need to accelerate their use of center research information. Your prompt response to this request will help me very much since I am now beginning my literature review.

Request Approved:

Sincerely yours,


Robert R. Price
Research Advisor


Young Joo Kim

APPENDIX C

NUMBER OF INTERNATIONAL STUDENTS IN
DIVISION OF AGRICULTURE

International Graduate Students
In Division of Agriculture by
Departments and Programs

<u>Department or Program</u>	<u>No. Students</u>
Agricultural Economics	34
Agricultural Education	7
Agricultural Engineering	9
Agronomy	10
- Crop Science	17
- Soil Science	7
Animal Science	2
- Animal Breeding	1
- Animal Nutrition	4
- Dairy Science	1
- Poultry Science	2
- Food Science	4
Biochemistry	9
Entomology	6
Horticulture	2
Plant Pathology	<u>3</u>
TOTAL	118

International Undergraduate Students
 Division of Agriculture
 by
 Departments and Programs

<u>Department or Program</u>	<u>No. Students</u>
Agricultural Economics	13
Agricultural Education	1
Agronomy	17
- Special Agriculture	2
- General Agriculture	2
Agricultural Engineering	5
Animal Science	19
- Food Industry	2
Biochemistry	1
Entomology	4
Forestry	1
Horticulture and Landscape Arch.	7
Plant Pathology	<u>2</u>
TOTAL	76

VITA 2

Young Joo Kim

Candidate for the Degree of
Doctor of Education

Thesis: PERCEPTIVE ASSESSMENTS OF SELECTED DISSEMINATION
STRATEGIES FOR INTERNATIONAL AGRICULTURAL RESEARCH
CENTER FINDINGS

Major Field: Agricultural Education

Biographical:

Personal Data: Born in Junnam, Korea, January 9, 1947,
the daughter of Min Koo and Young Ae Kim.

Education: Graduated from Jinmyung Girl's High
School, Seoul, Korea, in February, 1965; received
Certificate from City College of Seoul, Seoul,
Korea in February, 1969; studied Master's program
of Horticulture in Korea University, Seoul, Korea,
from September, 1974 until August, 1975;
received Master of Science Degree in Natural
Science from Oklahoma State University,
Stillwater, Oklahoma, in December, 1981; received
Master of Science Degree in Agricultural
Education and Extension from Oklahoma State
University, Stillwater, Oklahoma, May, 1983;
completed requirements for the Doctor of Education
in Agricultural Education and Extension from
Oklahoma State University, Stillwater, Oklahoma,
July, 1985.

Professional Experience: Taught Horticultural Class
for Vocational Adult Women's group in Seoul,
Korea, 1969-1973; Program Planning Officer,
Department of Program Planning in the National
Textbook Ltd. Co., Seoul, Korea, 1970-1971;
employed by Agricultural Experiment Station of
USDA at Oklahoma State University, Stillwater,
Oklahoma, 1980; honor of P.E.O. International
Peace Scholarship, 1984-1985; presented Doctoral

thesis results to the First Annual Meeting of Association for International Agricultural Education (AIAE), Chevy Chase, Maryland, U.S.A., April 24-26, 1985; member of American Phytopathological Society, 1979-1981; member of Phi Delta Kappa Educational Foundation, U.S.A., 1983 to present.